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THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

Published every Thursday Morning by David Williams, Nos. 96, 98, 100 & 102 Reade St., New York.

Vol. LIII: No. 5. New York, Thursday, February 1, 1894.

\$4.50 a Year, including Postage.
Single Copies, Ten Cents.

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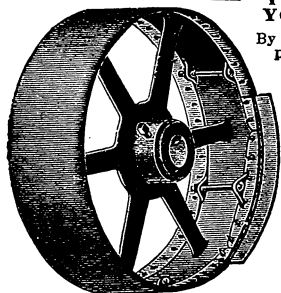
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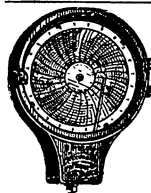
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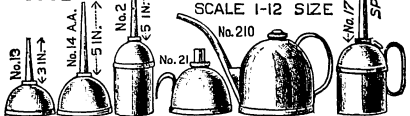
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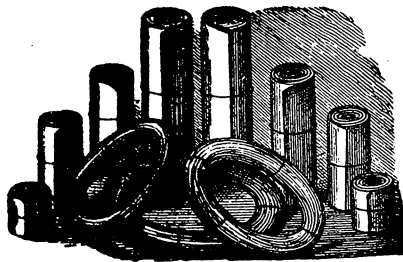
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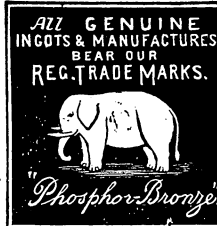
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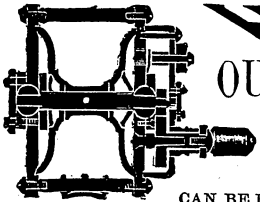
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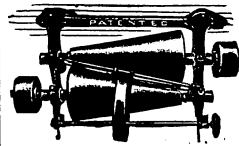
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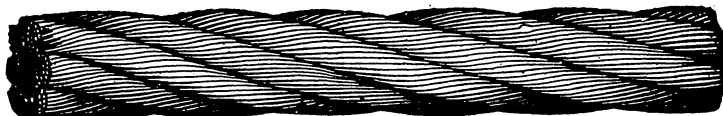
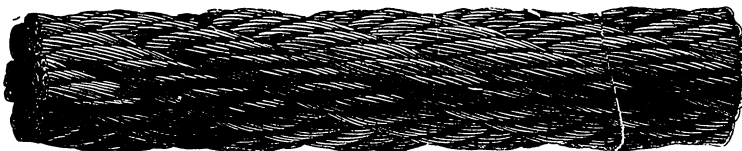
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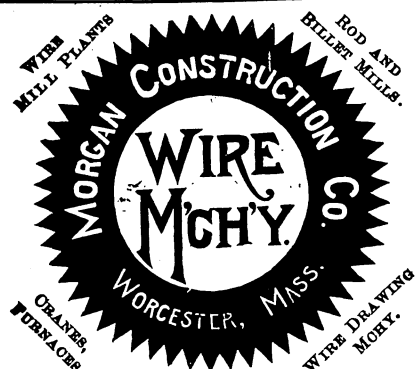
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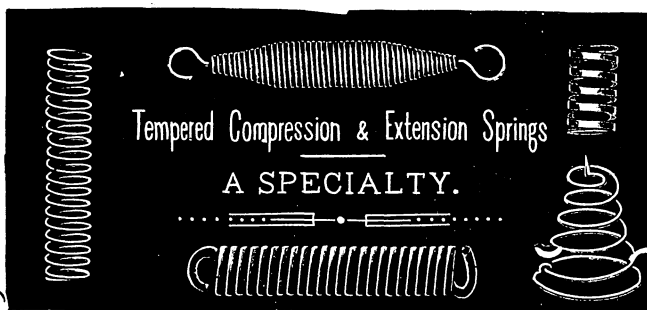


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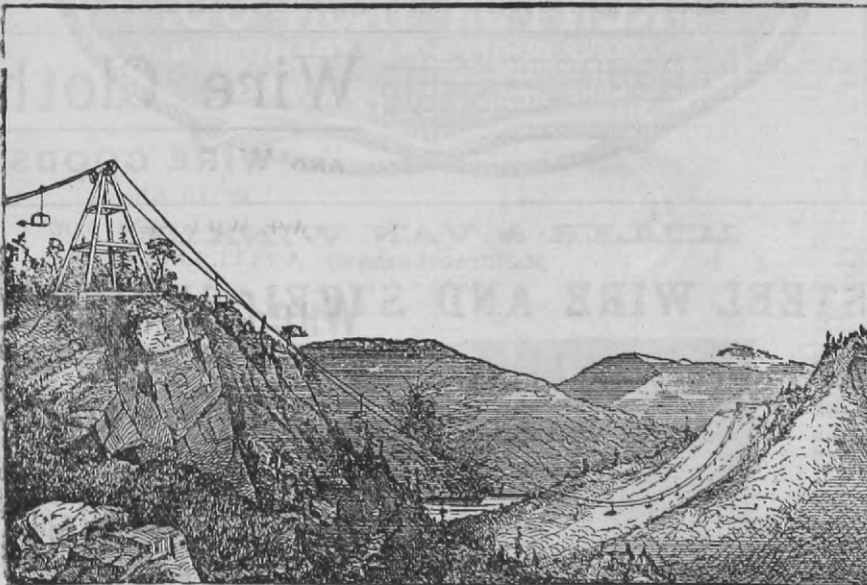
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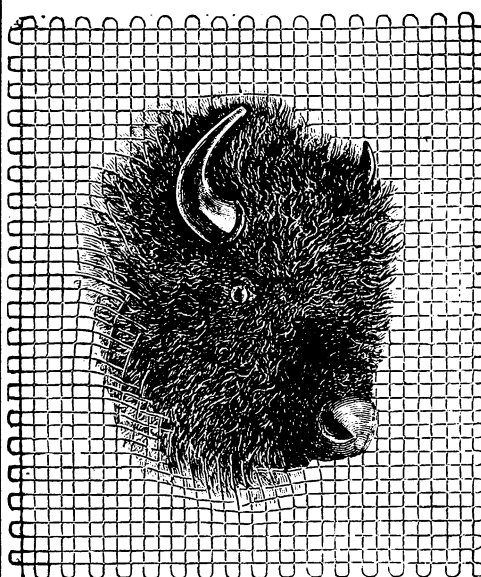
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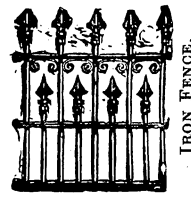
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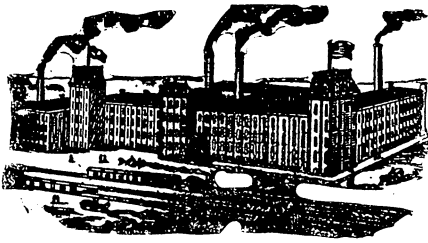


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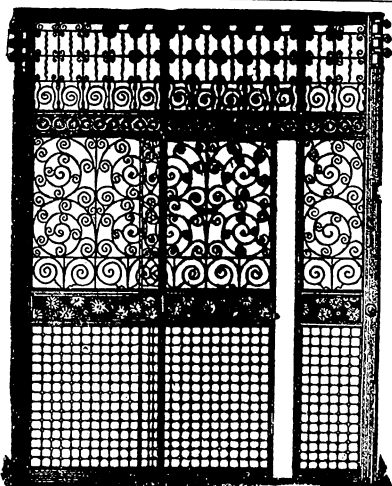
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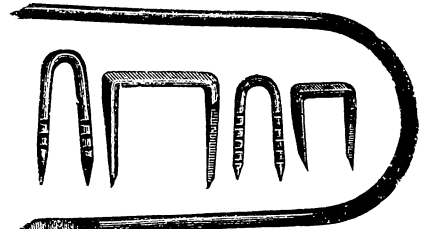
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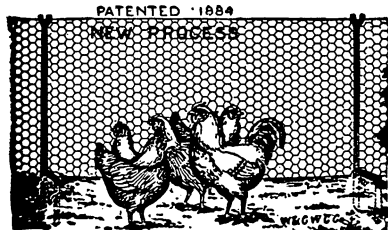
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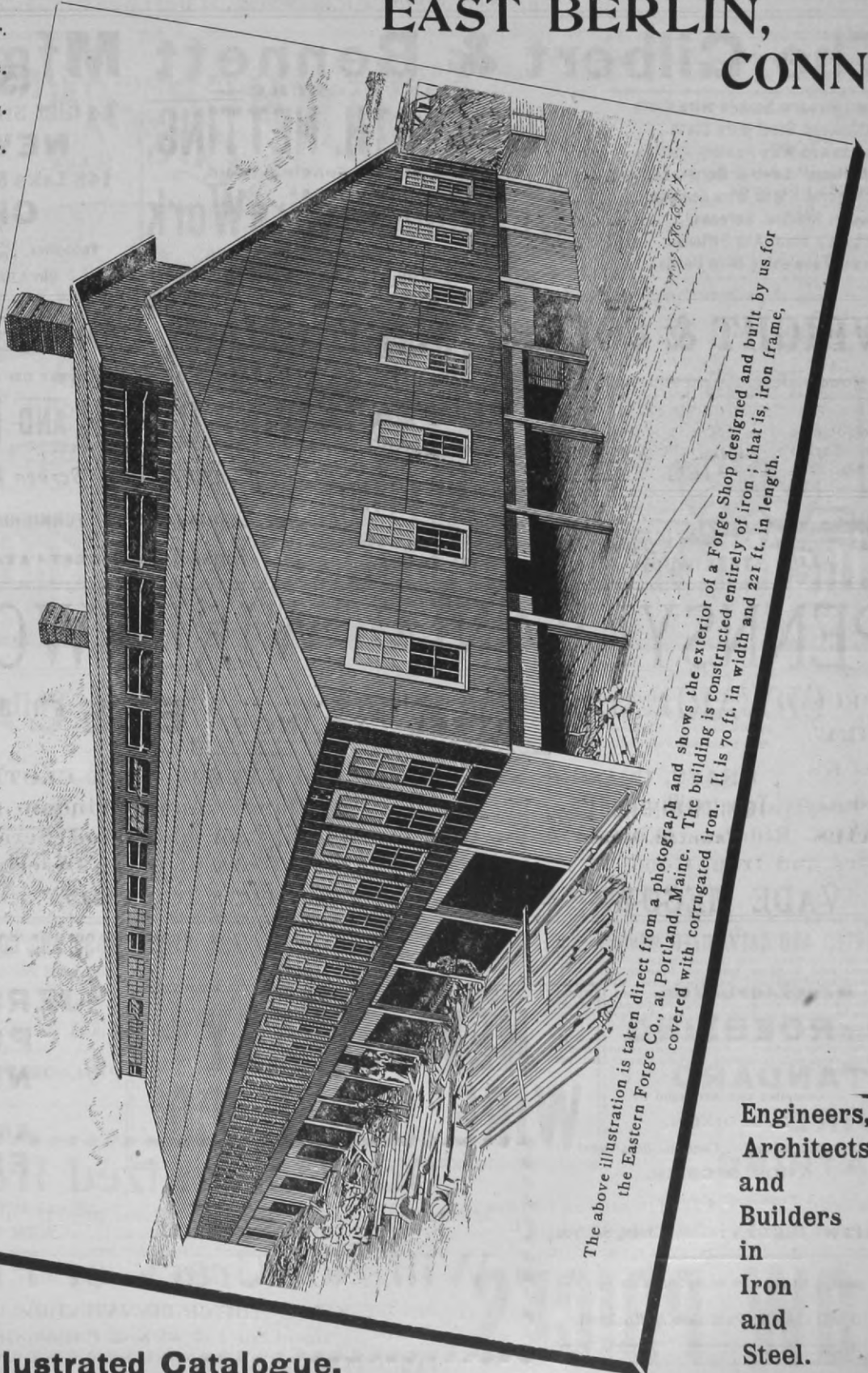
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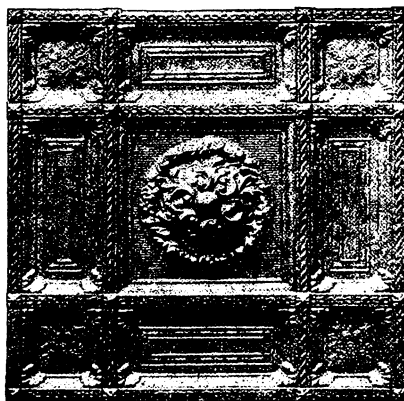
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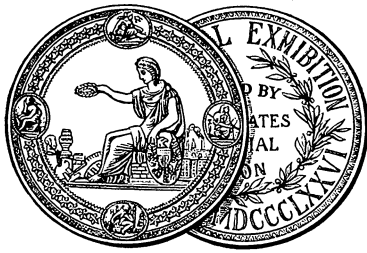
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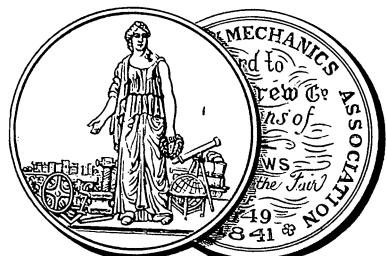
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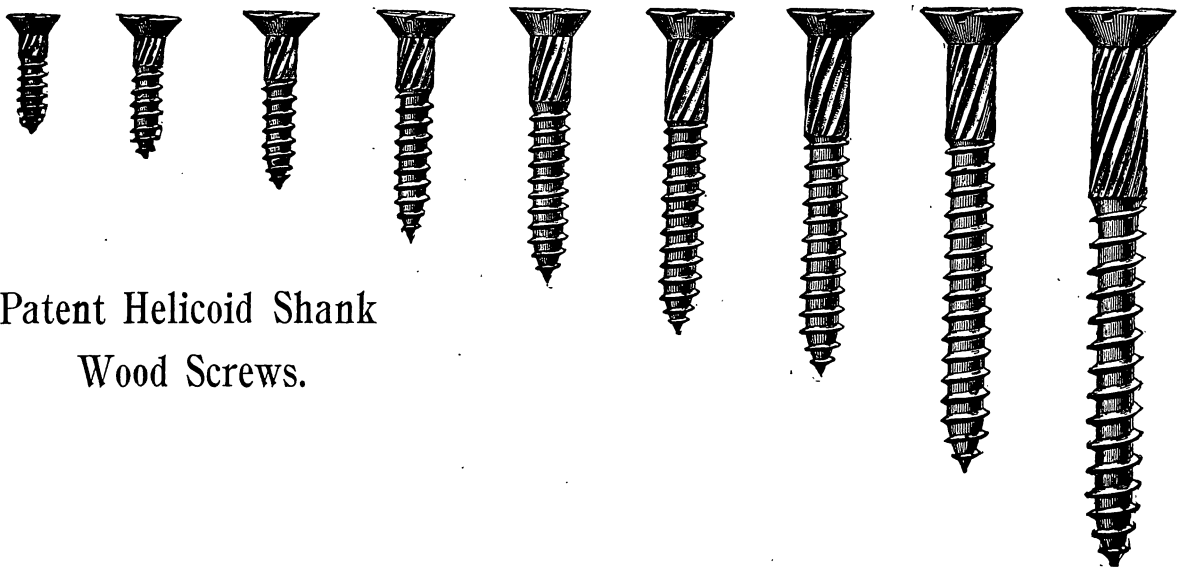
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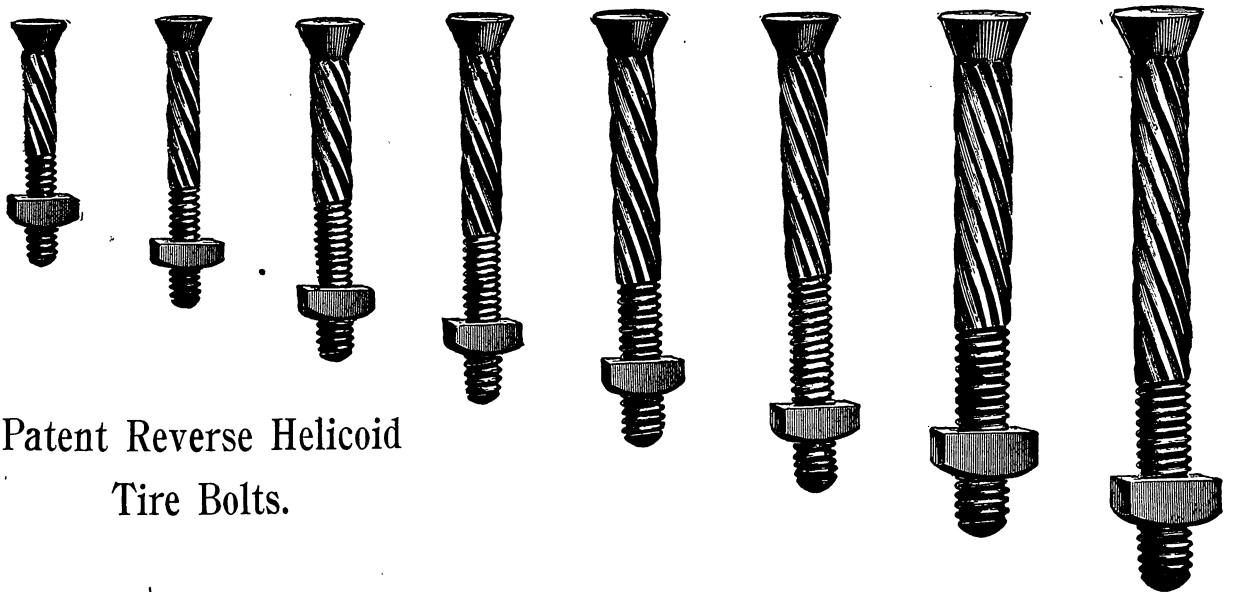
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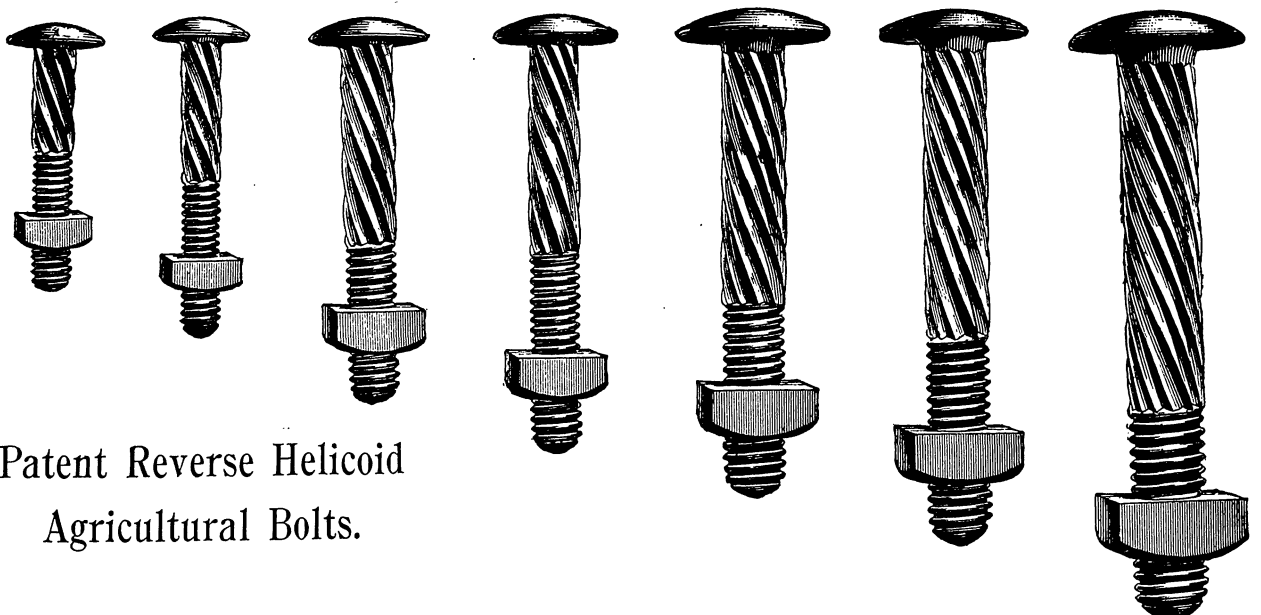
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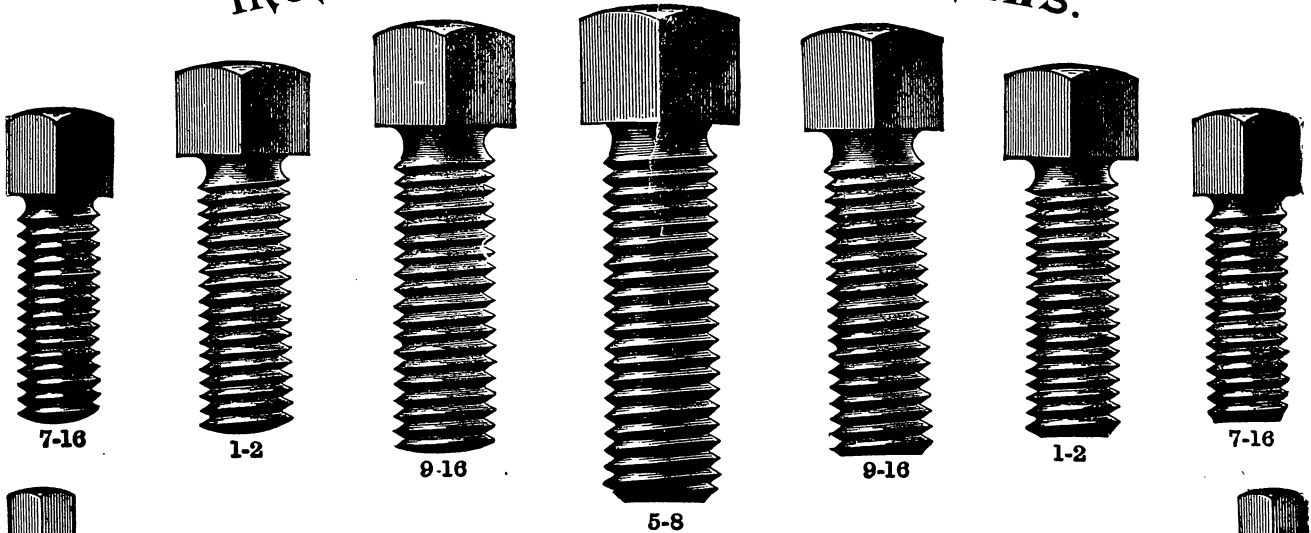
Patent Reverse Helicoid
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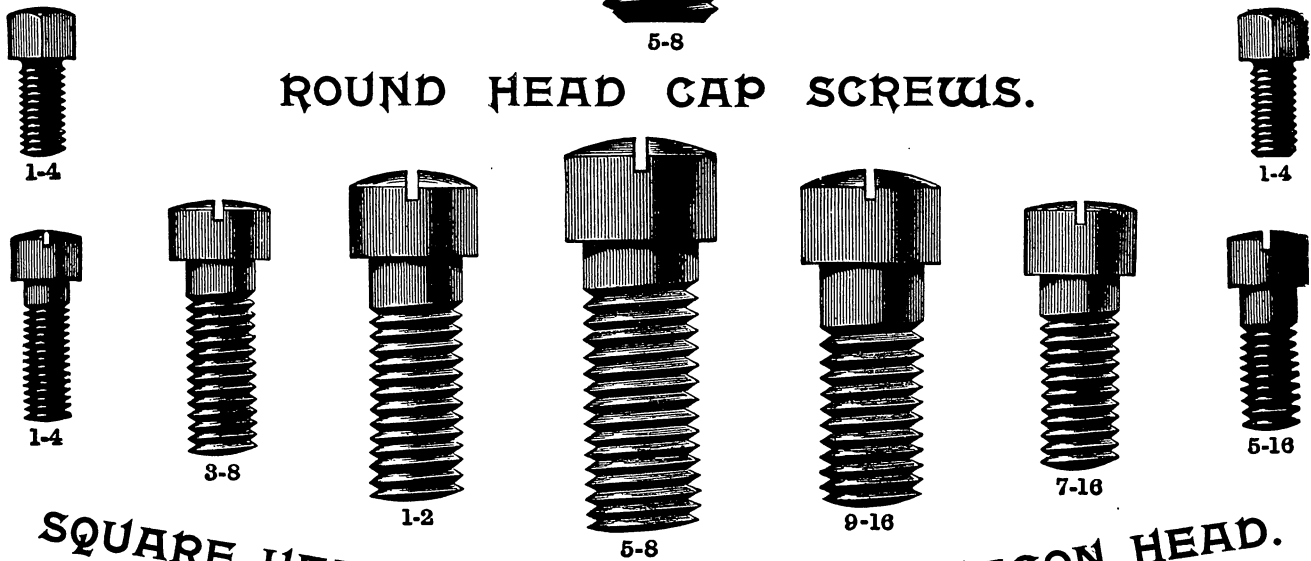
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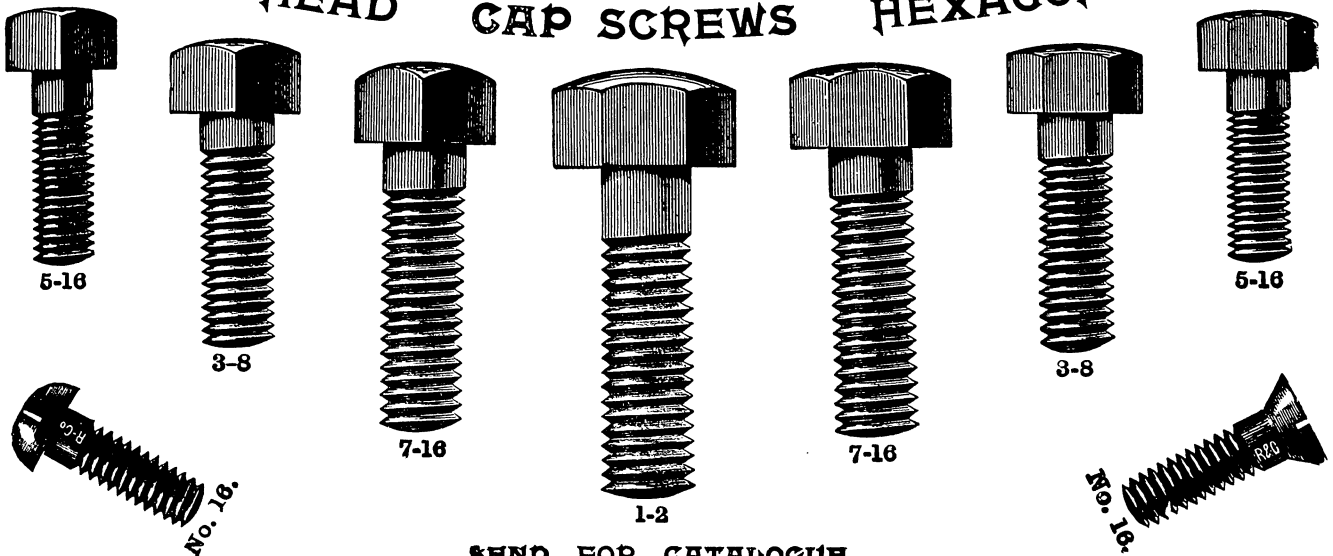
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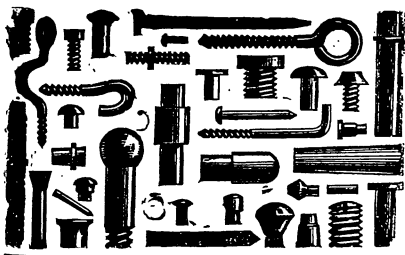
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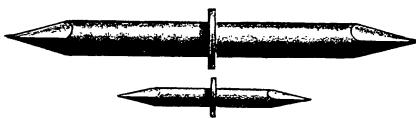
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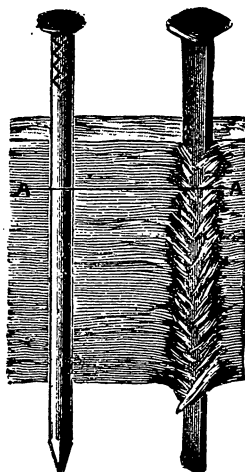
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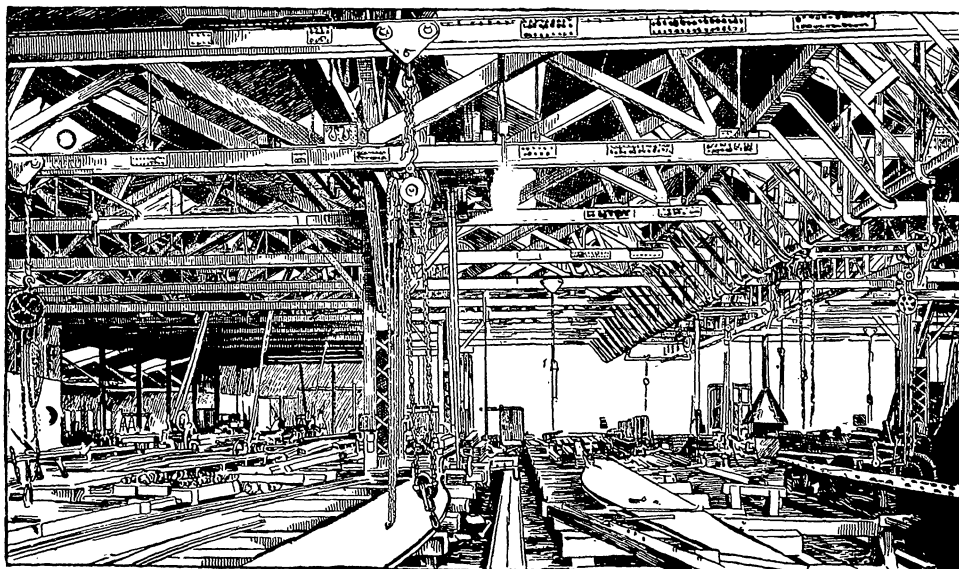
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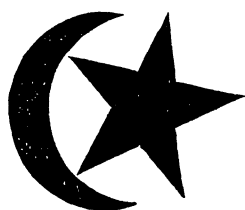
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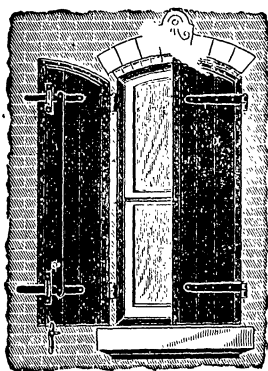
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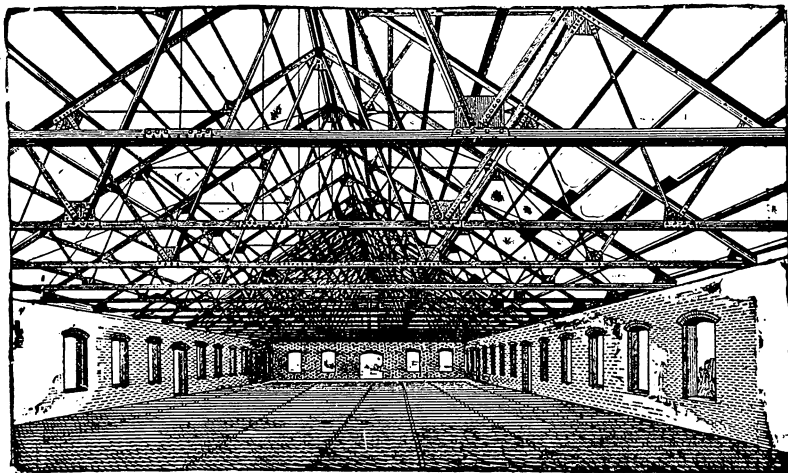
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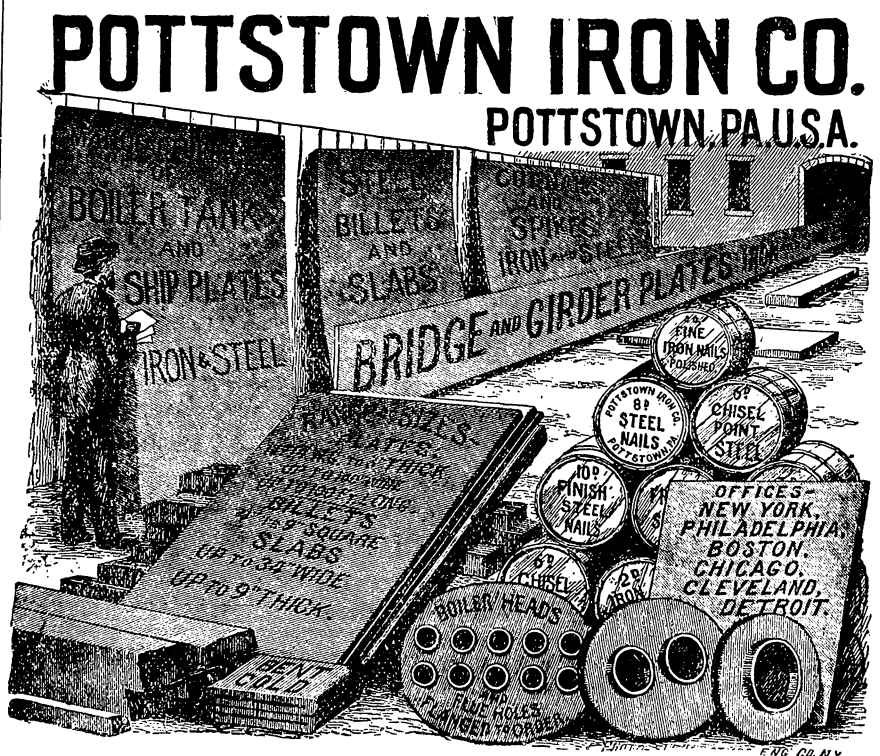
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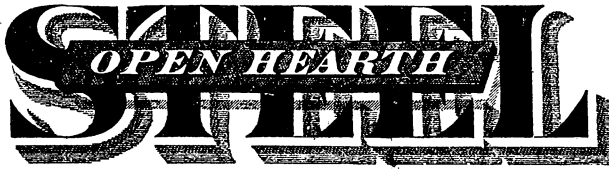
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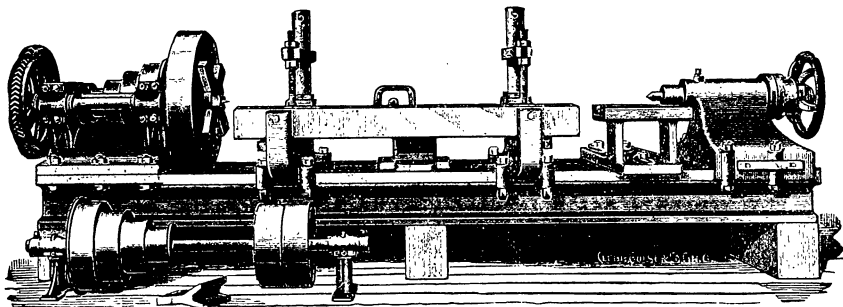
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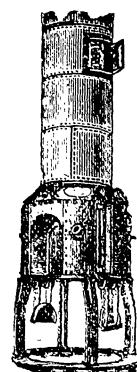
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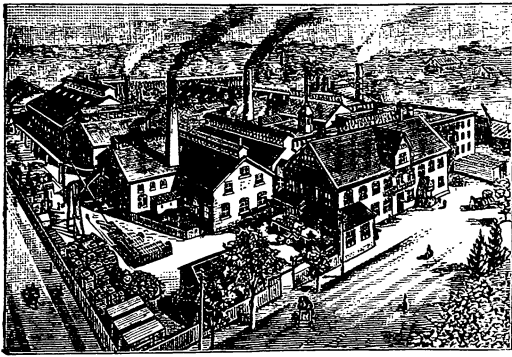
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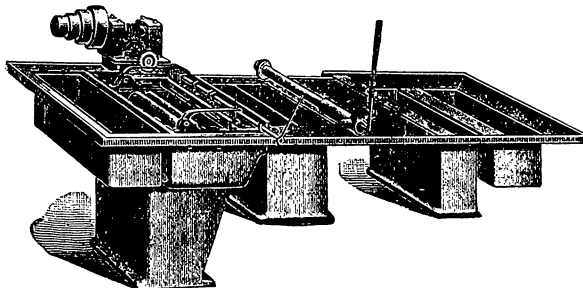
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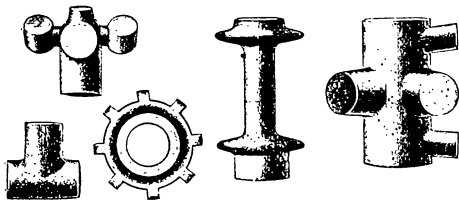


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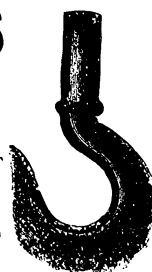
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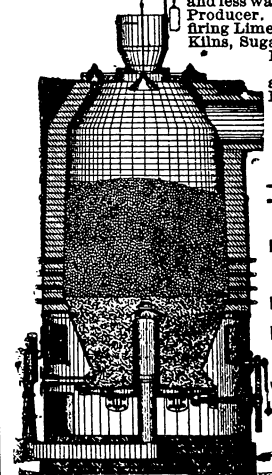
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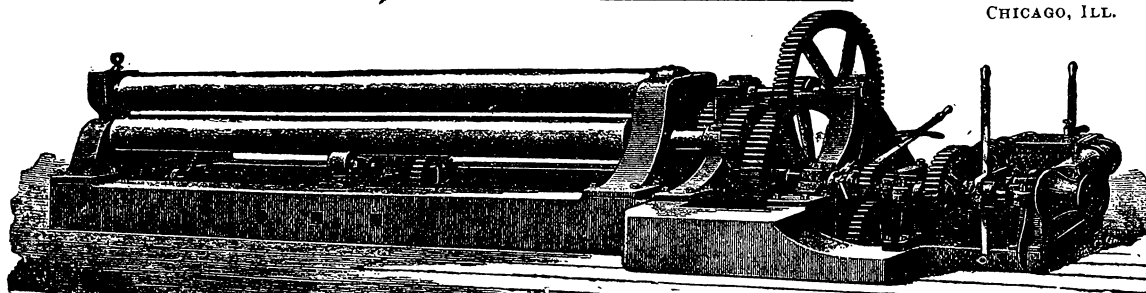
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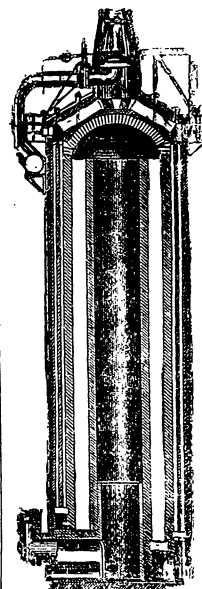
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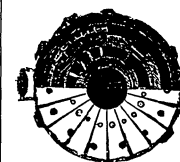
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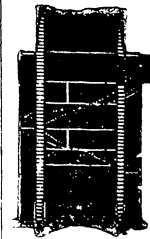
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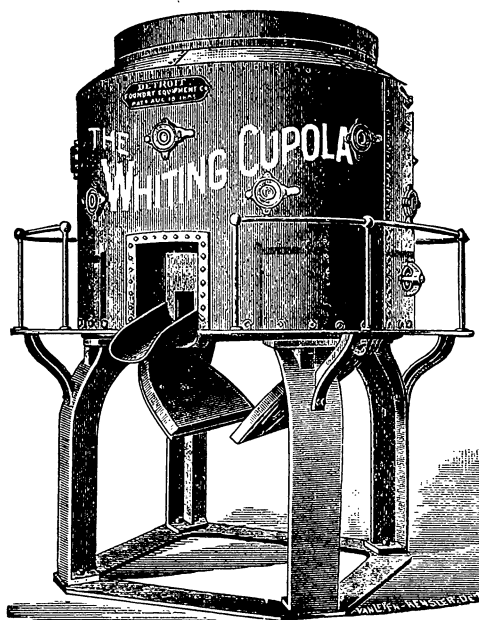
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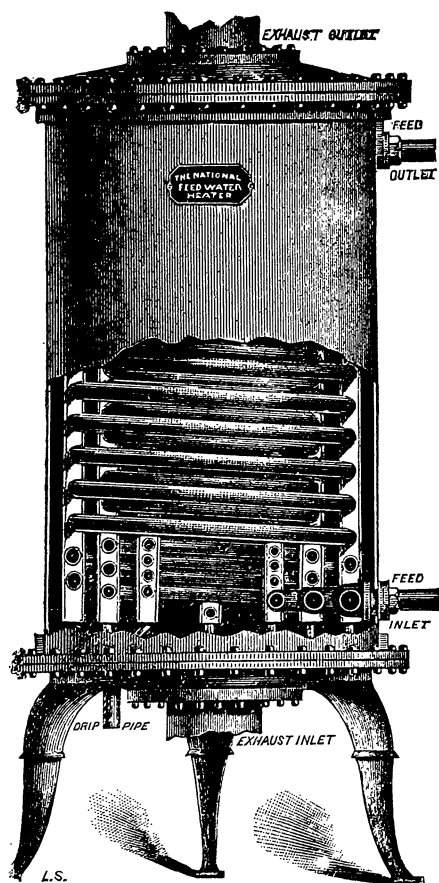
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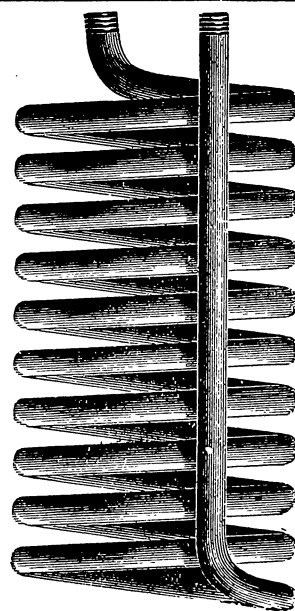
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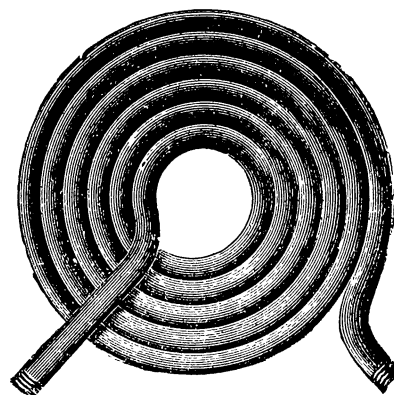
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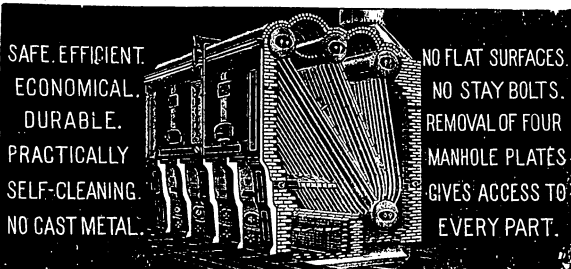
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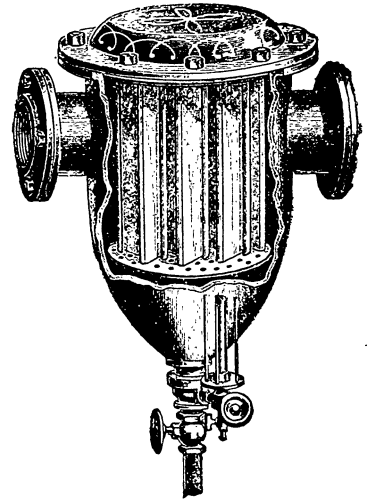
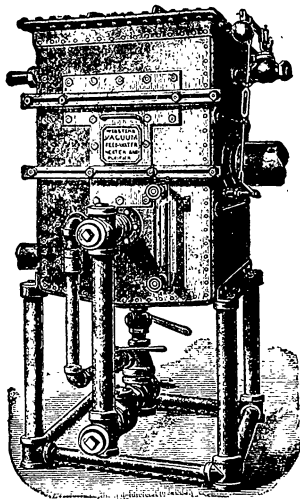
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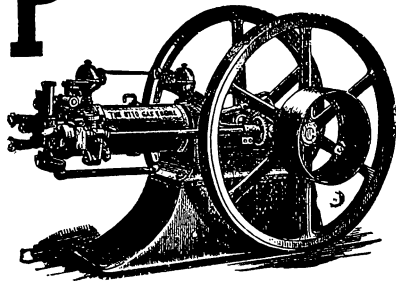
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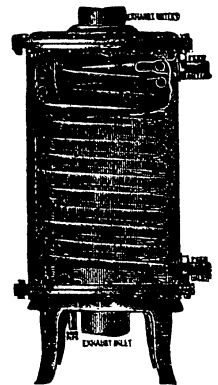
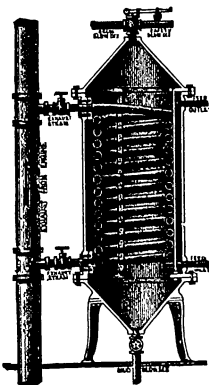
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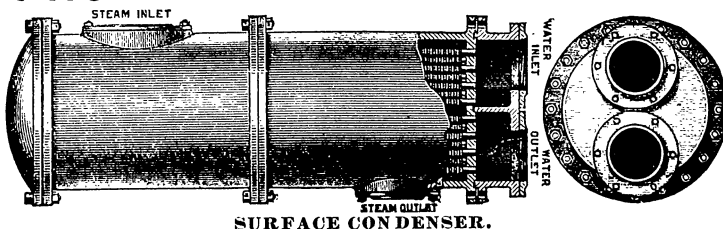
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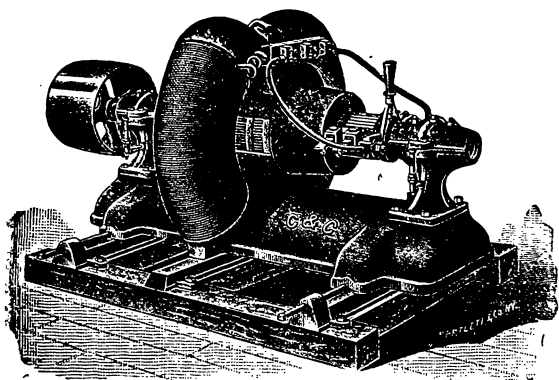


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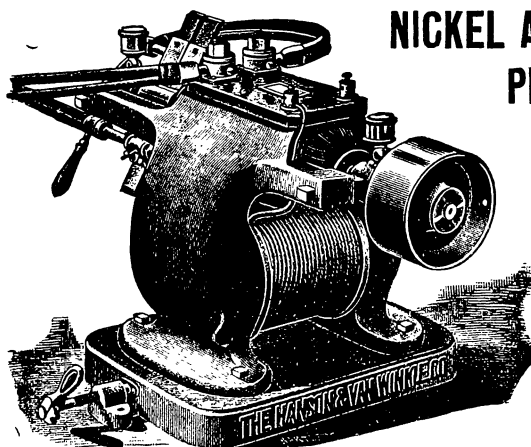
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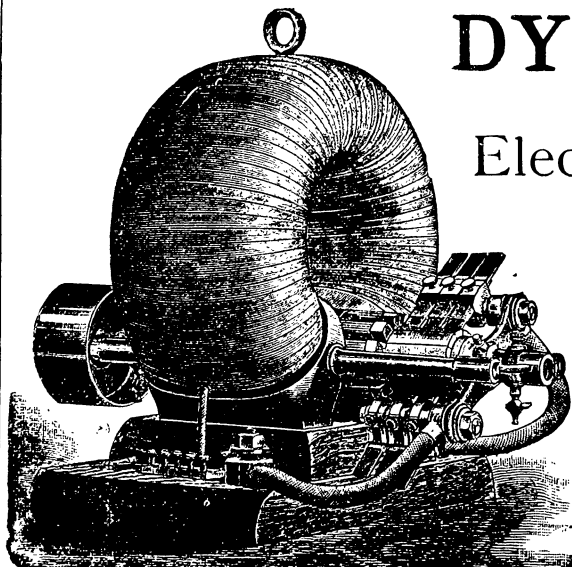
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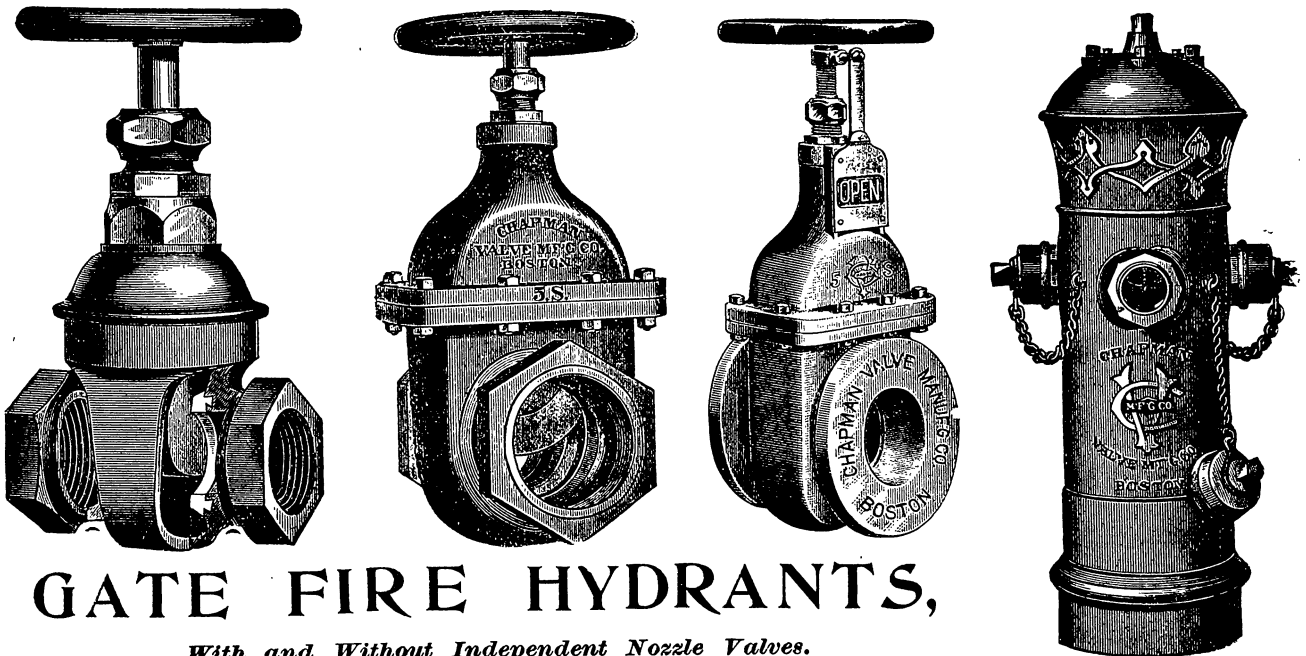
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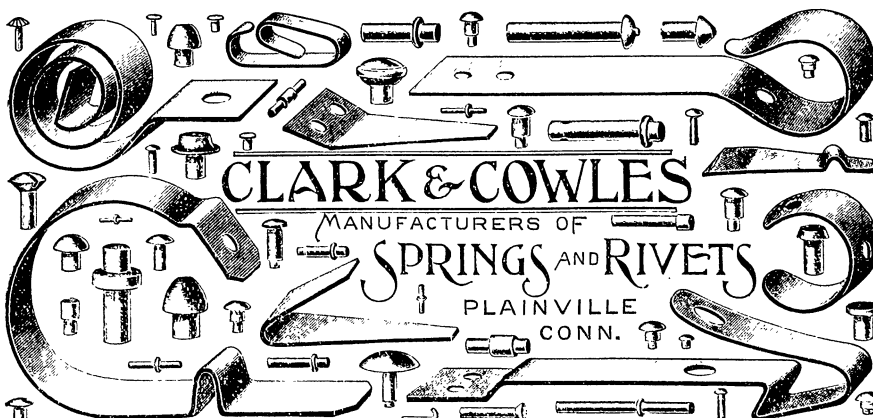
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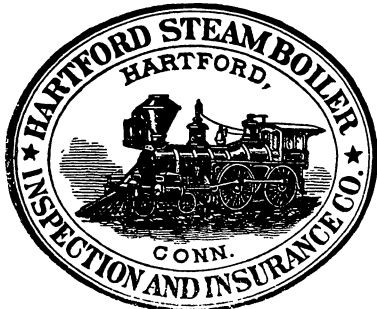


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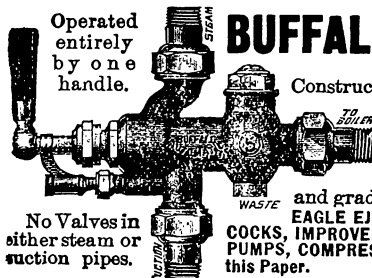
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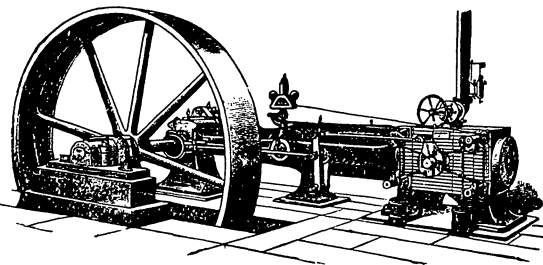
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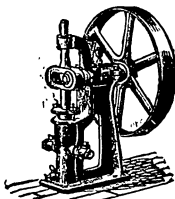
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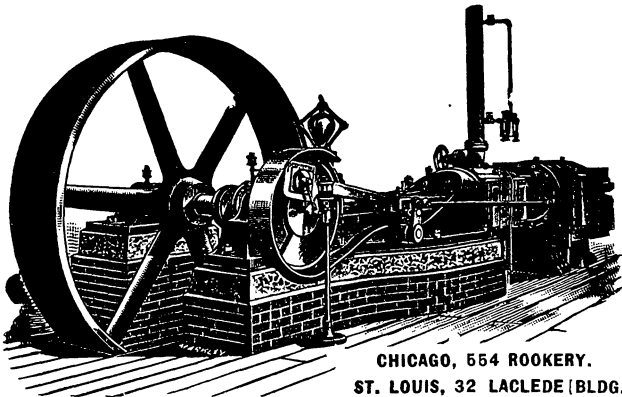
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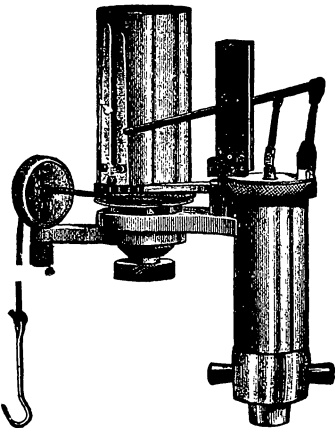
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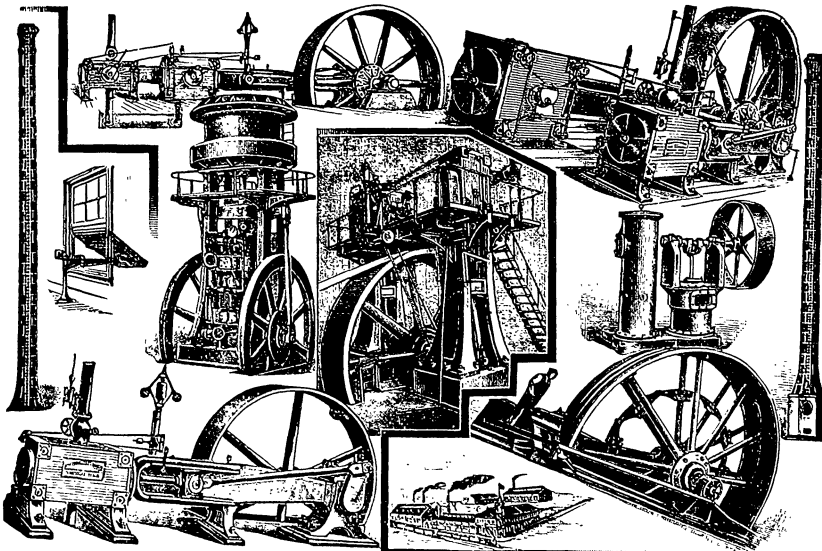
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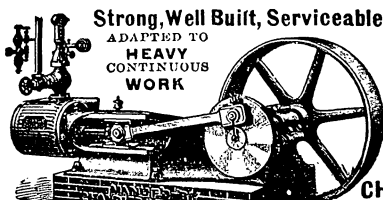
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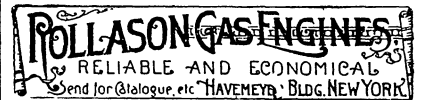
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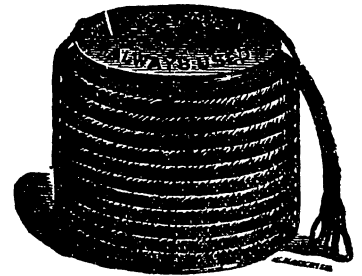


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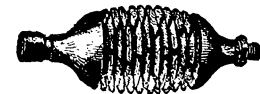
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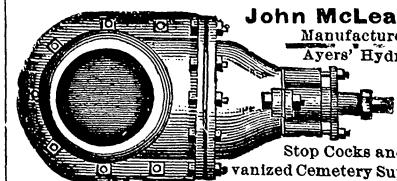
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From 1 1/4 to 16 in
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St. Louis, Mo.



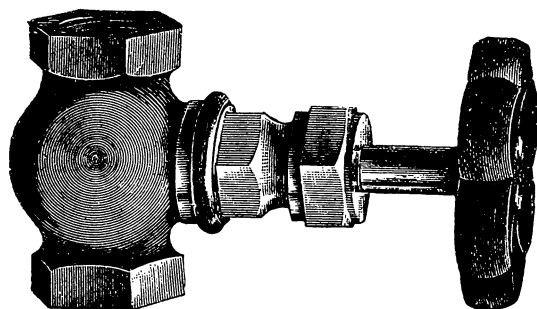
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Wrought Iron Pipe and Fittings. Plumbers' Materials. Seamless Brass and Copper Tubes.

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COMPACT. DURABLE. LOW-PRICED.
WRITE FOR COMPLETE ILLUSTRATED CIRCULAR
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Compound,
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BOILERS & COMPLETE
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For all Power and Heating Purposes.
Single Boilers 2-240 H.-P.
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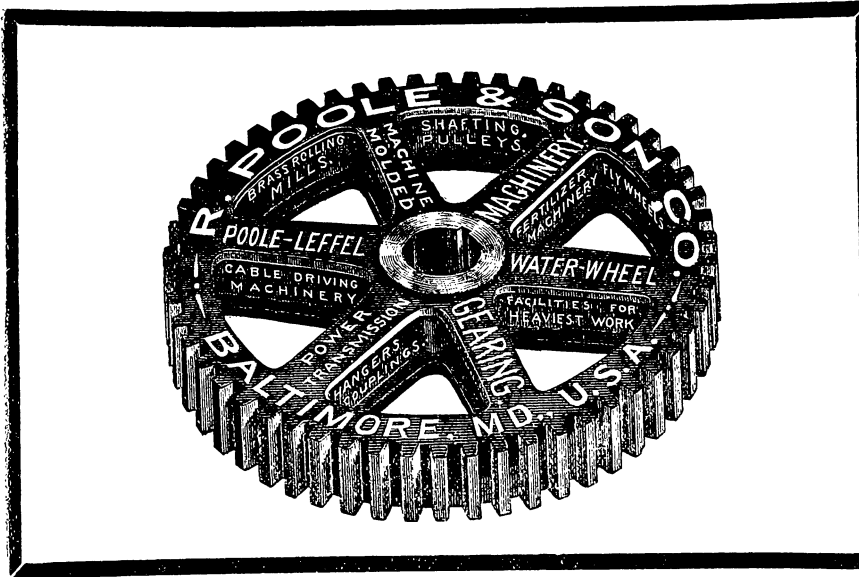
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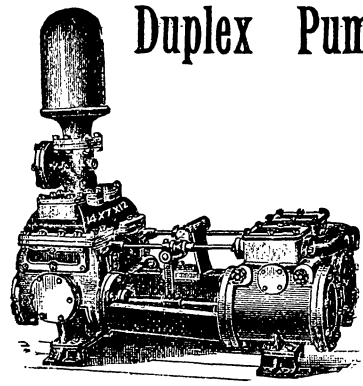
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Little Giant Rock Drill,	Sluggish Rock Drill,
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Column,	Derby Bit, and

Award on Collective Exhibit of Compressors and Drills.

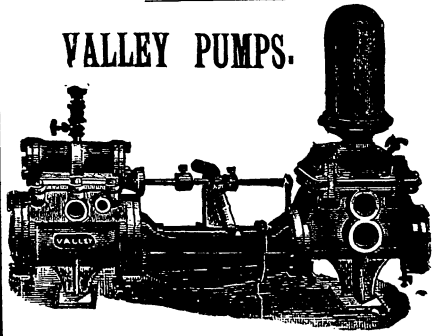
RAND DRILL CO., - 23 Park Place, N. Y.



Duplex Pumps.

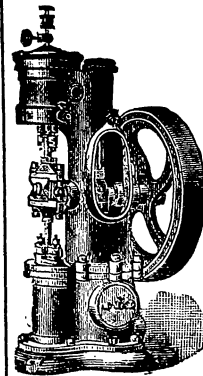


VALLEY PUMPS.

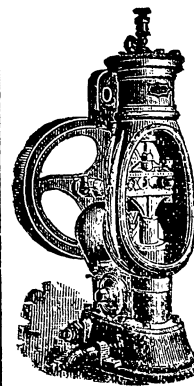


ACME

Steam Pumps

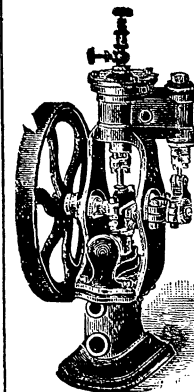


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Steam Pumps for feeding Boilers, filling Tanks, or Fire purposes.



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Steam Pumps

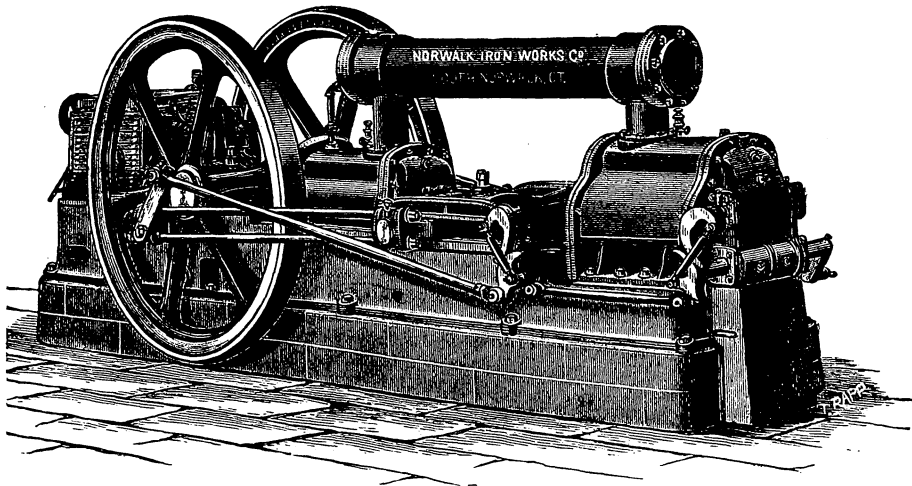
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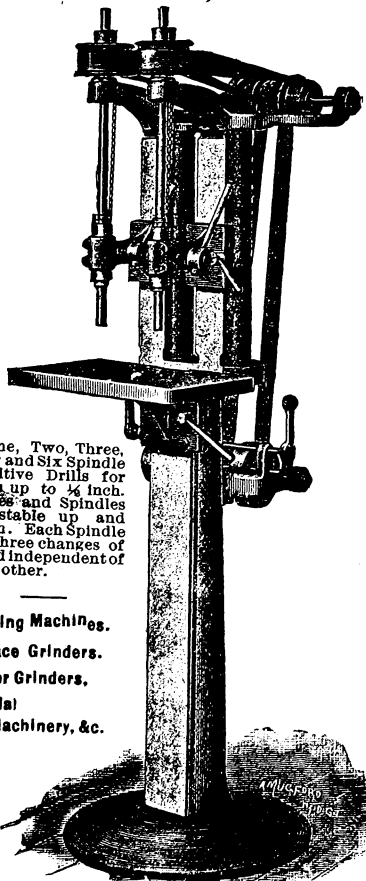
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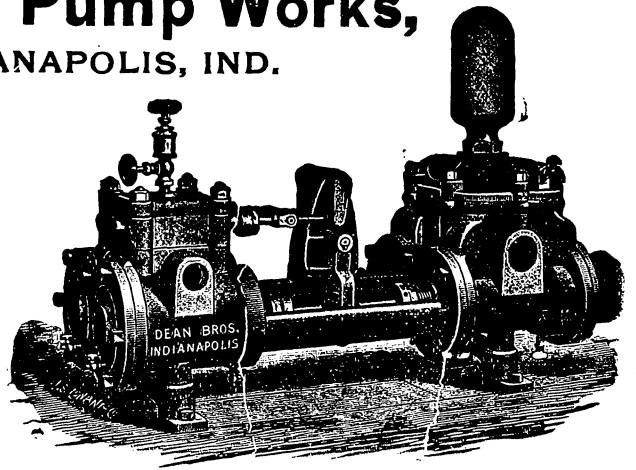
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SINGLE PUMPS.

**DEEP WELL
PUMPS.**

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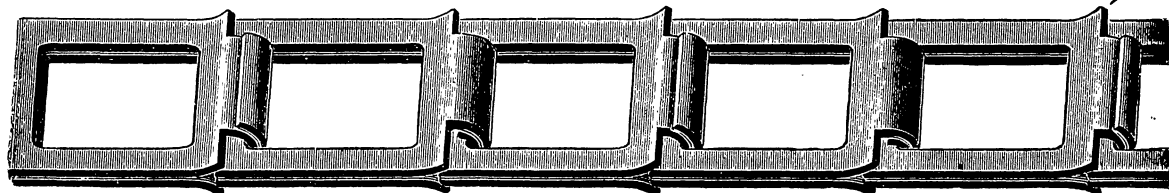
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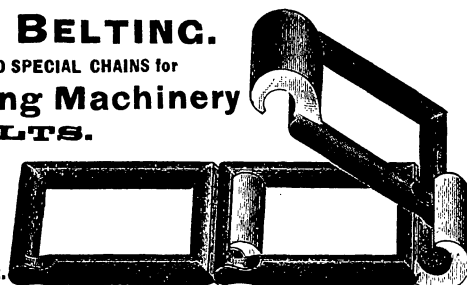
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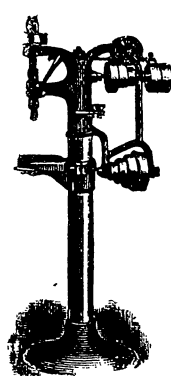
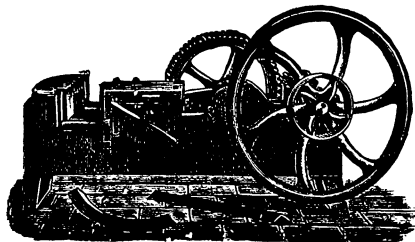
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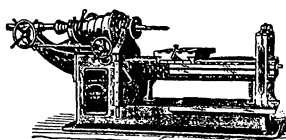
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Horizontal Boring and Drilling Machine.

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METAL-WORKING MACHINES.

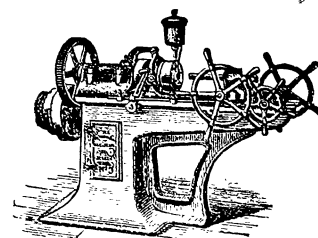
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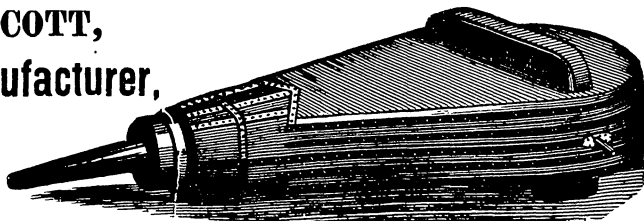
CATALOGUE SENT ON APPLICATION.

GEO. M. SCOTT, Bellows Manufacturer,

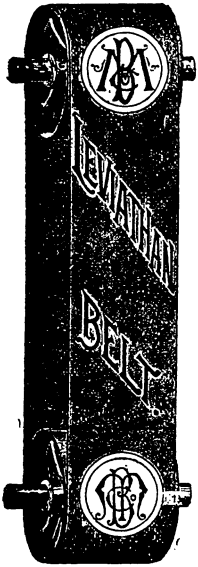
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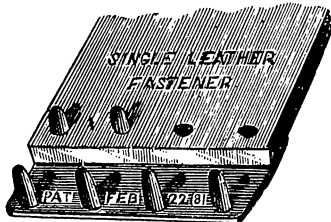


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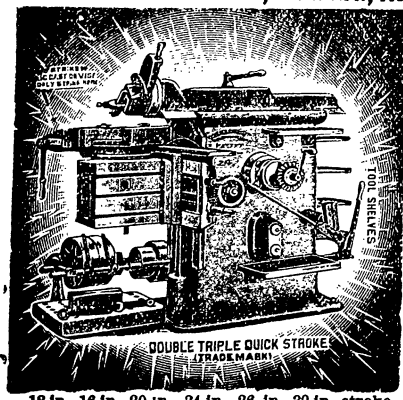
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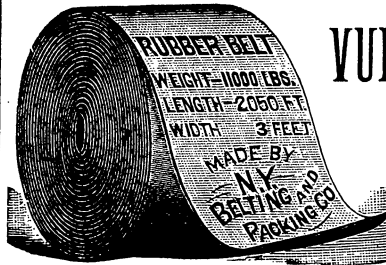
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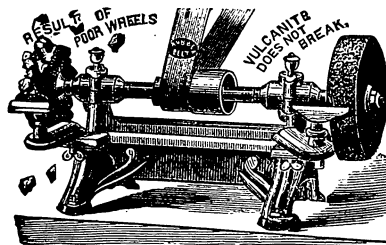
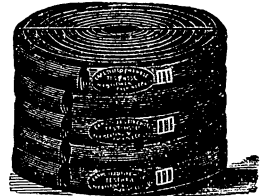
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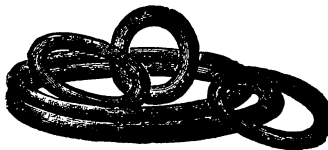
PHILADELPHIA, 308 Chestnut St.
BOSTON, 44 Summer St.
CHICAGO, 151 Lake St.
DENVER, 1601-1611 17th St.
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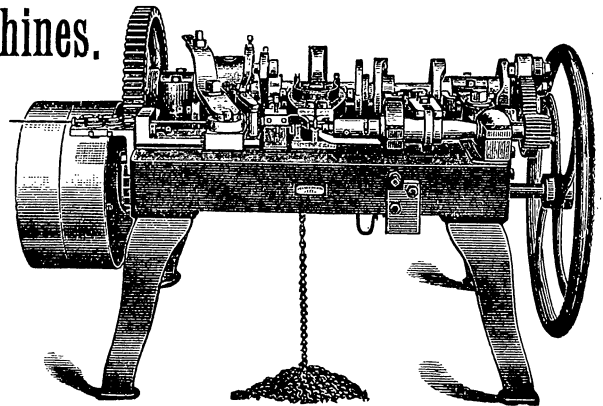
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Send for prices.

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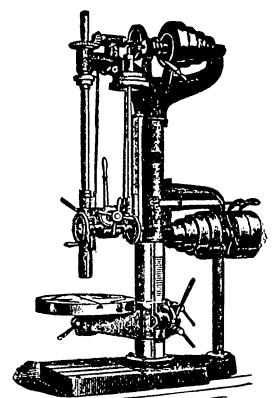
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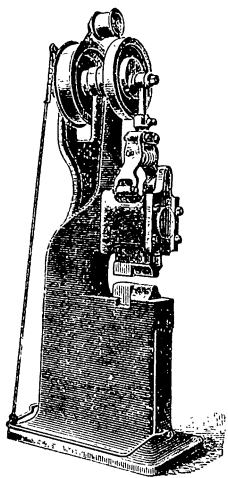
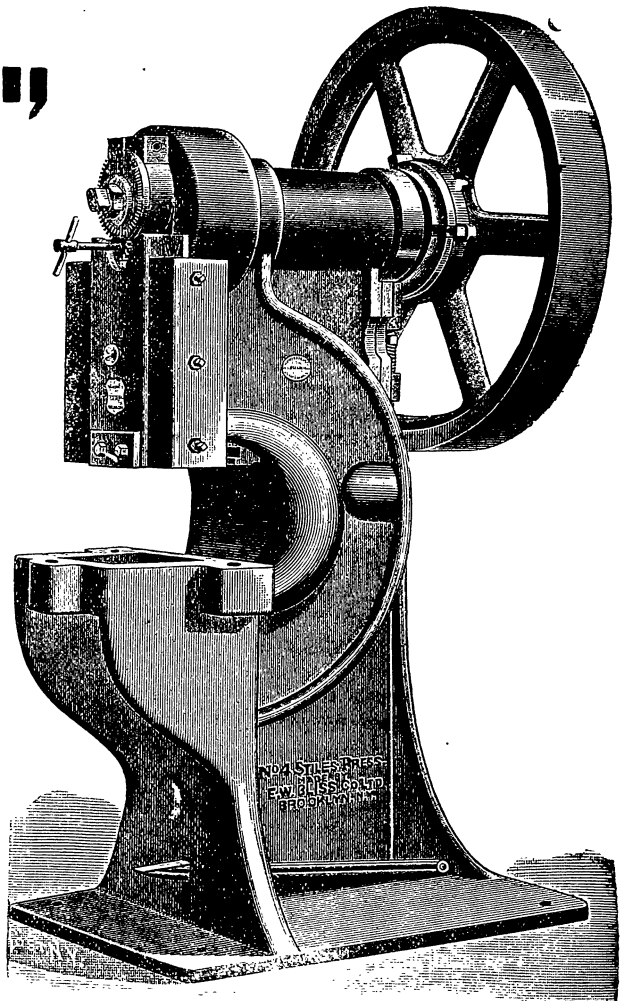
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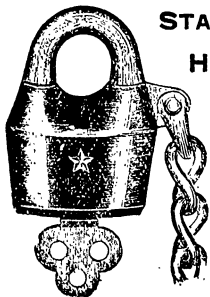
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Simplicity of Construction,
Economy of Power,
Economy of Space,
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HILLEBRAND & WOLF,

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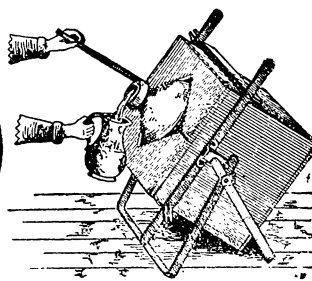
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CATALOGUES SENT ON APPLICATION



A. L. HENDERER,
Wilmington, Del.

MANUFACTURER OF

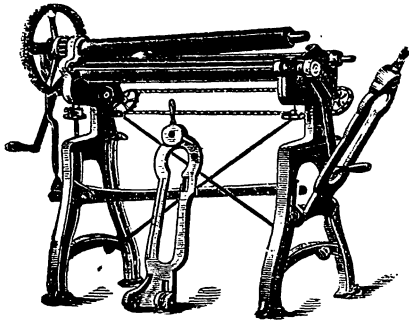
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Punches, Screw Punches,
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Vises

RIEHLE

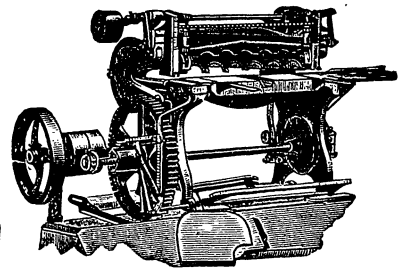
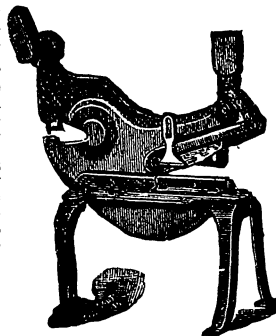
BROS. TESTING MACHINE CO., Phila., have issued a new describing and illustrating all the various styles of their U. S. Standard Testing Machinery with the special appliances. Marble Machinery, Rope Twisters, Loam Mills, Riehle-Robie Frictionless Ball Screw Jacks, Iron and Wooden Trucks, &c., &c., are described. It is desired to have one of these Catalogues in the office of every Superintendent, Purchasing Agent, Engineer or Manufacturer using such Machinery. A copy will be mailed free of charge to those who may apply.

CAT. No. 3

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Ferracute Machine Co.

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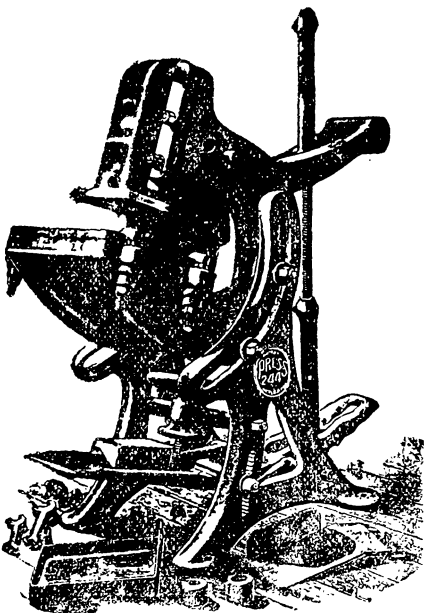
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176 and 178 So. Clinton St.

CHICAGO, ILL., U. S. A.

MANUFACTURE

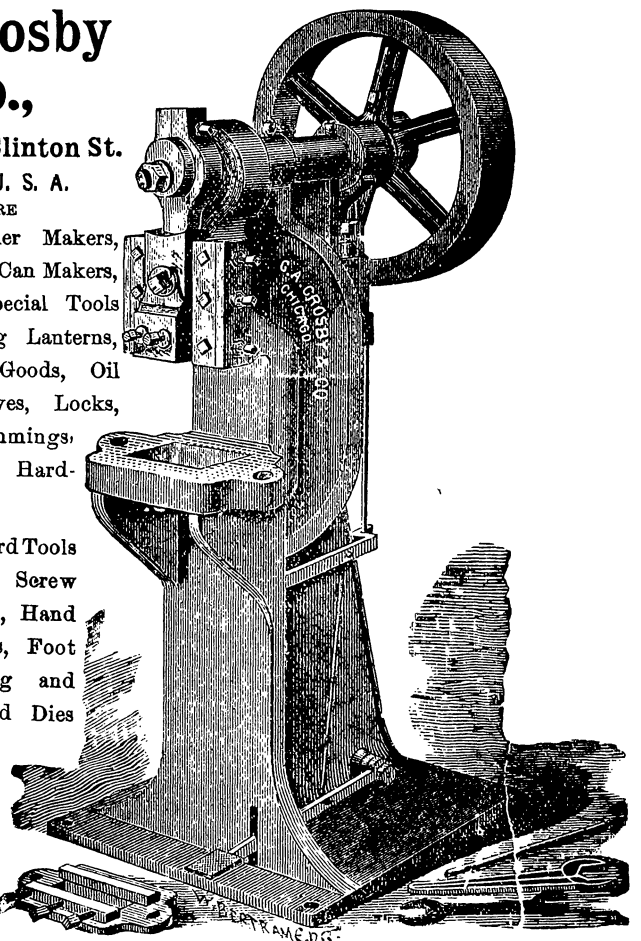
Machinery for Boiler Makers, Sheet Metal Workers, Can Makers, Soap Makers and Special Tools to order for making Lanterns, Bird Cages, Wire Goods, Oil Stoves, Vapor Stoves, Locks, Hinges, Trunk Trimmings, Brass Goods and all Hardware Novelties.

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No. 2.	4 x 1	30.00

IT IS WITHOUT A FAULT. ONE MOTION DOES IT ALL.
Every machine is tested and warranted to give satisfaction. We confidently offer this upsetter as the best to be had.

BUTTS & ORDWAY,

MANUFACTURERS,

500 Atlantic Avenue,

BOSTON.

ALSO DEALERS IN

Heavy Hardware.

Iron and Steel.

Carriage and Wagon Wheels.

Contractors' Supplies.

— SEND FOR CATALOGUE. —



LINK-BELT

ENGINEERING CO.
NICETOWN,
PHILA.
49 DEY ST.
NEW YORK

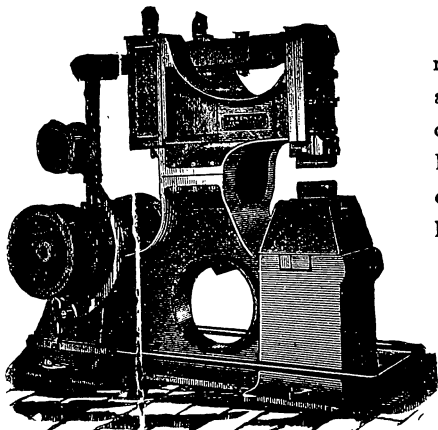
Elevators, Conveyors, Manila Rope Power Transmission Machinery, Ewart Detachable Link Belting, Dodge Chain, Howe Chain, &c.

General Eastern Agents for Fibre-Graphite Journal Bearings for shafting and machines. Require no oil or other lubricant. Moderate in price, durable and guaranteed. Bearings furnished to fit hangers now in use.

WESTERN CONNECTION

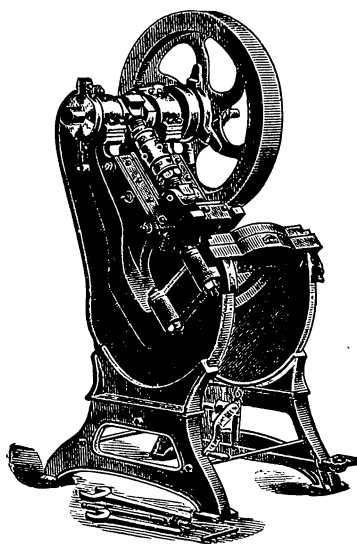
[CHICAGO,] LINK BELT MACHINERY CO.

JENKINS' POWER HAMMERS.



Adjustable and elastic stroke, nicety of regulation, efficiency of action, simplicity and durability of construction and the absence of leather straps, steel springs and all complication, combine to make this hammer the favorite wherever used.

JENKINS & LINGLE,
BELLEFONTE, PA.



Presses, Dies, Presses, OF ALL KINDS FOR Sheet Metal Ware.

Difficult and Intricate Drawing
Stamping, Embossing, Wiring,
Blanking and Combination
Dies a Specialty.

SUBMIT SAMPLES AND WRITE FOR PRICES.

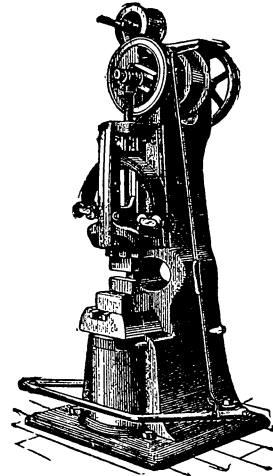
Stark Machine & Tool Co.,
BUFFALO, N. Y.

Send for Catalogue and mention "The Iron Age."

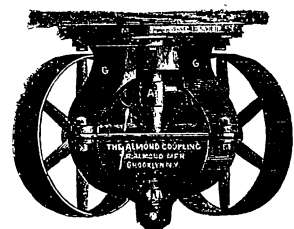
If You Use Power Hammers

Write to us for Circulars.

BELDEN MACHINE CO.
NEW HAVEN, CONN.



Chicago Office, 65 South Canal Street.



THIS CUT REPRESENTS
ALMOND'S PAT. QUARTER-TURN COUPLING
To Replace Mule Pulleys and Bevel Gears.
It is a noiseless quarter-turn countershaft, self-contained, perfectly lubricated, and gives no trouble. Send for particulars.
T. R. ALMOND, 83 and 85 Washington Street Brooklyn, N. Y.



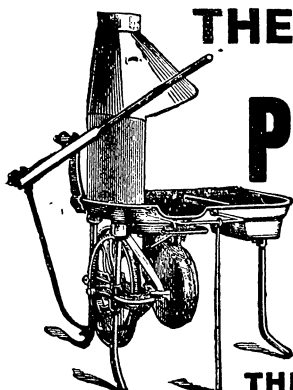
BARNES' UPRIGHT DRILLS.

Complete line, ranging from our New Friction Disk Drill, for light work, to 42-inch Back Geared Self Feed Drill.

Send for Catalogue and Prices.

W. F. & JOHN BARNES CO.
69 Ruby St., Rockford, Ill.

ENGLISH AGENTS, CHAS. CHURCHILL & CO.,
21 Cross St., Finsbury, London, E. C.



THE CYCLONE PORTABLE FORGES

Have Double Ratchet, Solid Frame, Adjustable Legs, Detachable Lever. Run Lightest, Make Strongest Blast & Last Longest. ALL DESIRABLE STYLES AND SIZES. Sold by Hardware and Machinery Dealers everywhere. Send for Catalogue of these and Hand & Power Blower, Blacksmith Drill Presses, &c.
THE FOOS MFG. CO. SPRINGFIELD, OHIO.

THE VALLENTINE TOOL CO.,
223 State St., Hartford, Conn.

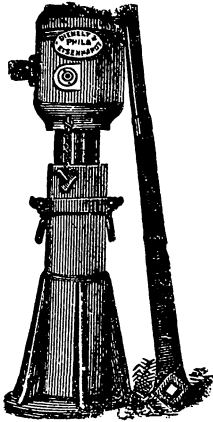
— MANUFACTURE —
STEEL RULES, FLEXIBLE
and SPRING TEMPER.



SEND FOR LIST AND DISCOUNTS.

RELIANCE HYDRAULIC JACKS.

SUPERIOR TO ANY JACK NOW MADE.
Absolute in its actions in any position.
Under complete and instantaneous control.



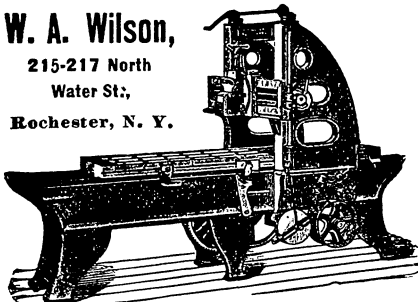
MADE IN FOUR SIZES,
10, 15, 20 and 30-ton capacity, to lift 12 or
18 inches. Broad Base or Ground Lift.

DIENELT & EISENHARDT,
MAKERS,
1308 Howard Street, Philadelphia.

W. A. Wilson,

215-217 North
Water St.,

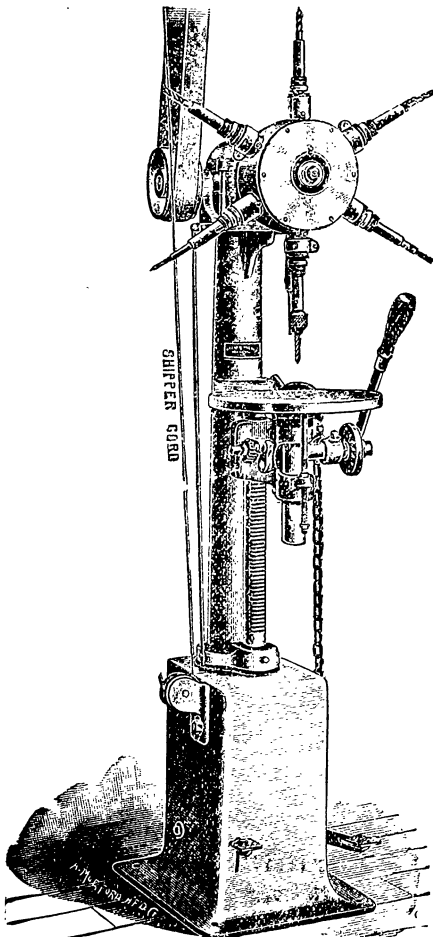
Rochester, N. Y.



Improved Iron Planers a specialty. 20 x 20, 22 x 22
24 x 24 up to 42 x 42, to plane any length. Send for
description and price-list before purchasing. Manu-
facturers' agent for other tools and machinery. Men-
tion *The Iron Age*.

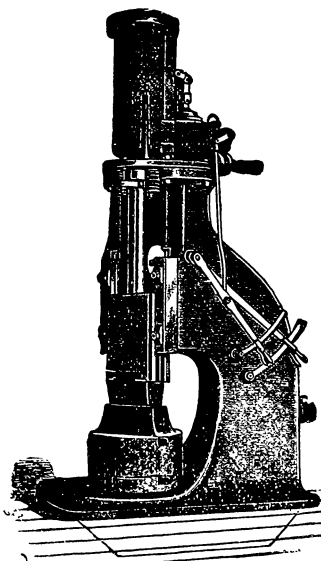
QUINT'S TURRET DRILLS.

SIX SPINDLE.



Speed of Drills from 250 to 2,000 revolutions, and
may be changed to any intermediate speed
instantly; only the Drill in use revolves,
all others remain stationary.

Send for Circular. Drills from 0 to $\frac{1}{4}$ inch.
Address **A. D. QUINT, Hartford, Conn.**



Bement, Miles & Co.,

PHILADELPHIA, PA.,

Builders of

Metal-Working Machine Tools

For railroad shops, locomotive and car builders,
machine shops, steam forges, shipyards, boiler
shops, bridge works.

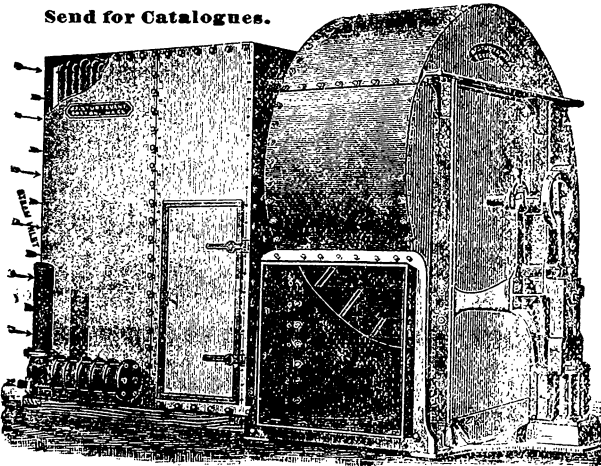
**Steam Hammers for Working Iron
or Steel.**

NEW YORK OFFICE, Equitable Building.

GEORGE PLACE, Agent.

THE STURTEVANT SYSTEM OF HEATING AND VENTILATING

Send for Catalogues.



Manufacturing
Establishments.

PRESSURE
BLOWERS.
PORTABLE
FORGES.

B. F. Sturtevant Co.
Boston, Mass.

91 Liberty Street,
NEW YORK.

16 South Canal St.
CHICAGO.

135 North Third St.
PHILADELPHIA.

IF YOU WANT ANYTHING IN THE LINE OF
**DROP PRESSES · DROP HAMMERS ·
STAMPS OR AUTOMATIC
DROP LIFTERS**

SEND FOR CATALOGUE TO

Miner & Peck Mfg. Co.
New Haven, Conn.

LARGEST LINE IN THE MARKET

Engravings Show the Style of Die
Head which the

Bignall & Keeler Mfg. Co.,

ST. LOUIS, MO.,

PLACE ON THEIR

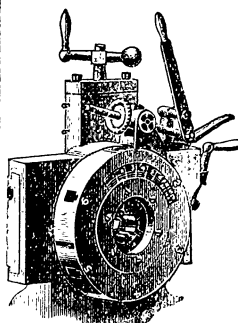
PEERLESS AND DUPLEX

Pipe Threading & Cutting Machines.

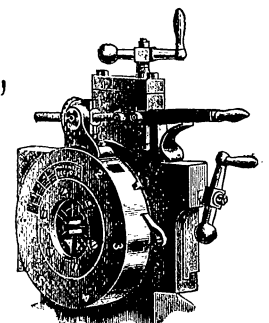
Write for Prices on the

Most Perfect and Economical Line
of Machines on the Market.

Mention *The Iron Age*.



"Peerless" Head showing
dies expanded.



"Peerless" Head showing
dies closed.

D. SAUNDERS' SONS

MANUFACTURERS OF PATENT



In three styles. **One Wheel and Roller Cutter**. **Three Wheeled Cutter** and the **Tool Cutter**, for cutting **Brass**, **Copper** and **Wrought Iron Tubes**. Also mfrs. of **Pipe Cutting** and **Threading Machines** $\frac{1}{4}$ in. to 16 in., Hand or Power.

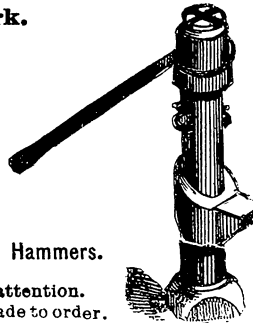
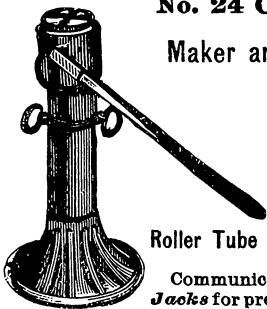
Send for Catalogue to **27 ATHERTON ST., YONKERS N. Y.**

RICHARD DUDGEON,

No. 24 Columbia Street, New York.

Maker and Patentee of the Improved

Hydraulic Jacks AND Punches.



Roller Tube Expanders and Direct-Acting Steam Hammers.

Communications by letter will receive prompt attention.
Jacks for pressing on Car Wheels or Crank Pins made to order.

Hand Punches and Shears

 $\frac{3}{4}$ in. hole in $\frac{1}{2}$ in. iron.

For Round, Flat, Square and Corrugated Iron.

Portable Hydraulic Beam Punches,
(1 inch hole in 1 inch iron.)

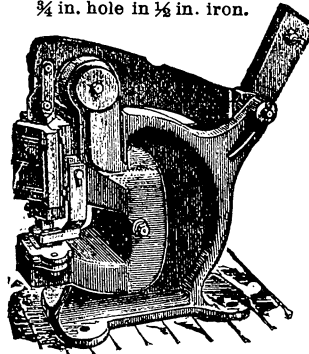
Polishing and Buffing Machinery,

IMPROVED HYDRAULIC JACKS, to raise
from 4 to 150 Tons.

Hydraulic Presses, *all styles*; Hydraulic Hand and Power
Pumps; Accumulators, &c.

WATSON & STILLMAN,

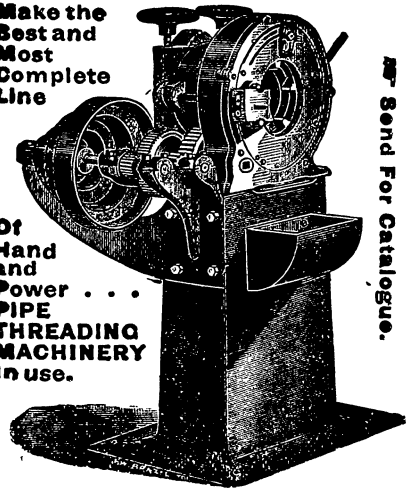
204, 206, 208, 210 E. 43d Street, New York.



The Merrill Manufacturing Co.,
Toledo, Ohio,

Make the
Best and
Most
Complete
Line

Of
Hand
and
Power . . .
**PIPE
THREADING
MACHINERY**
in use.

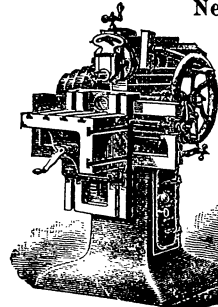


Send For Catalogue.

NEW HAVEN MANUFACTURING CO.,

New Haven, Conn.

Manufacturers of



**Lathes,
Planers,
Drills,
Slotters,
ETC.**

CONTRACTS WANTED.

To build light or heavy special Machinery*
Patented articles, tools, etc. Facilities for
experimental work. Correspondence solicited.
The L. E. RHODES CO.,
Hartford, Conn.

JOHN ADT & SON,

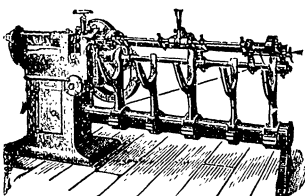
NEW HAVEN, CONN.
BUILDERS OF

Machinery for Hardware Manufacture.

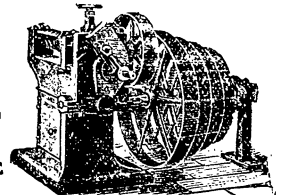
BUTT MILLING MACHINERY,

BUTT DRILLING MACHINERY, RIVETING MACHINES, WIRE
STRAIGHTENING MACHINERY, FOOT PRESSES.

SPRUE CUTTERS, ETC.

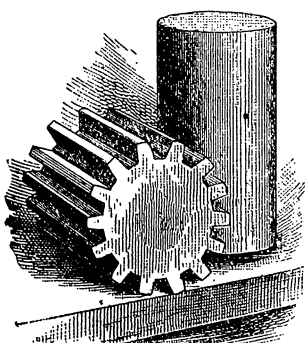


Automatic Wire Straightening and Cutting Machine.



Automatic Wire Straightening and Cutting Machine.

HYDRAULIC FORGING.



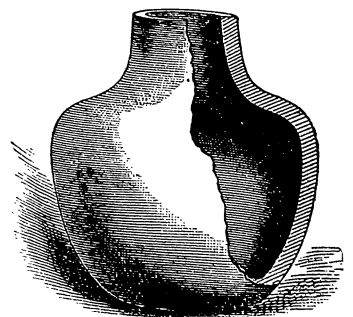
Billet and Patent Hot-Pressed Steel Pinion.

Steel Bottles, Air and Gas Receivers
drawn from Solid Steel or Plates,
Crank Shafts, Straps, Wrists, Pins,
Irregular Shapes, Discs, Cups,
Boiler Heads, Steel Flanges
for High Pressure Steam,
Drawn Steel Tubing for Bi-
cycles, Boilers, Etc.

THE UNITED STATES PROJECTILE CO.,

1st Avenue and 53d St., Brooklyn, N. Y.

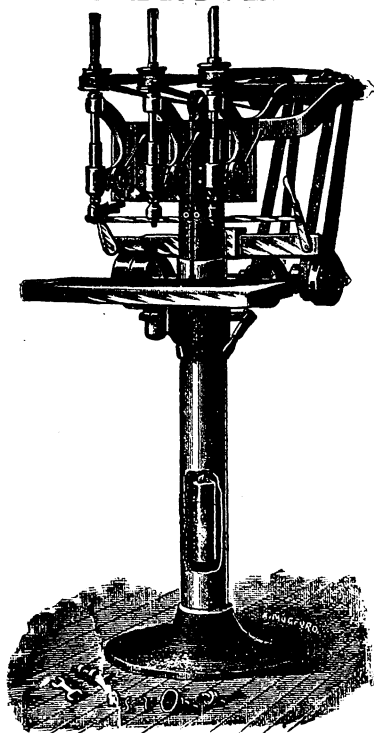
CORRESPONDENCE SOLICITED



Steel Bottles, any thickness or shape.

SIGOURNEY DRILLS.

IMPROVED.



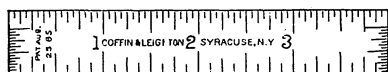
Sensitive Strong and Interchangeable

One, Two and Three Spindles.

Counter-balanced Spindles and Tables. Vertical range of table, 30 inches, and it will swing to right or left.

SEND FOR CIRCULAR.

THE SIGOURNEY TOOL CO.,
Hartford, Conn.



MACHINISTS' SCALES.

PATENT END GRADUATION.

Liberal Discount to the Trade. Send for List.

COFFIN & LEIGHTON, Syracuse, N. Y.

DRILL PRESSES
MFRS. OF
THE LARGEST
VARIETY
SEND FOR NEW
30 PAGE CATALOGUE
JUST OUT
DWIGHT SLATE
MACHINE CO.
HARTFORD, CONN.



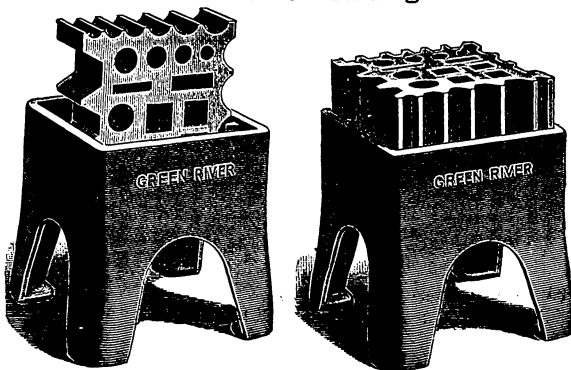
OUR ADJUSTABLE STOCKS and DIES are universally acknowledged to be the BEST! We also make all our Tools on the same principle of the Best Material and Workmanship, and always with a view of time and labor saving in their use.

"Green River" Mandrels, Swage Blocks and Stands.

(VERY CONVENIENT FOR BLACKSMITHS.)

Also Screw Plates, Taps, Dies, Reamers, Drills, Bolt Cutters, Punching Presses, Tire Benders, Tire Shrinkers, Horse Shoers' Machines, &c.

Send for Catalogue.



Mfd. by WILEY & RUSSELL MFG. CO.,

Greenfield, Mass., U. S. A.

New York Agency for Wiley & Russell, 114 Liberty St.

Maule's "Skeleton" Pipe Die

Two "Points" about it—only 2 (There are plenty more, but we only mention these two here.)

I

The First Cost to you of MAULE'S "SKELETON" PIPE DIE is less than that of any other Pipe-Threading Die—and

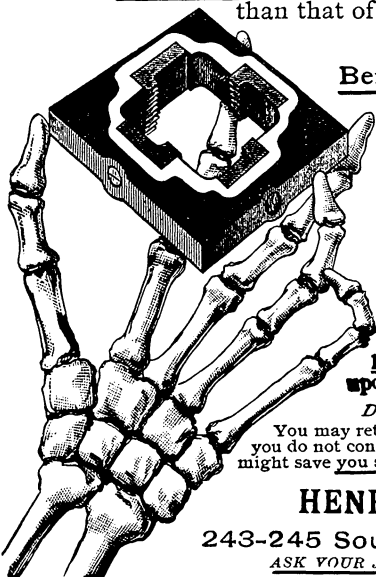
2

Before it becomes dull from use it will cut as many perfect threads as the best solid die extant, and when it is dull, you don't throw it away and buy a new one—Oh, no! You simply sharpen the cutters on a common grindstone, and so make it practically as good as it was at first, and this sharpening process may be repeated a number of times.

A sample One-inch "Skeleton" Pipe Die, either $2\frac{3}{8}$ or $2\frac{1}{2} \times \frac{1}{4}$ thick, by mail, postage prepaid, will cost you 62 cents, and will be sent upon receipt of a Postal note for that amount.

DO NOT SEND US ANY POSTAGE STAMPS.

You may return such sample to us, at our expense, if, after seeing it, you do not consider it worth the price. Don't the above sound as if it might save you some money—if TRUE?



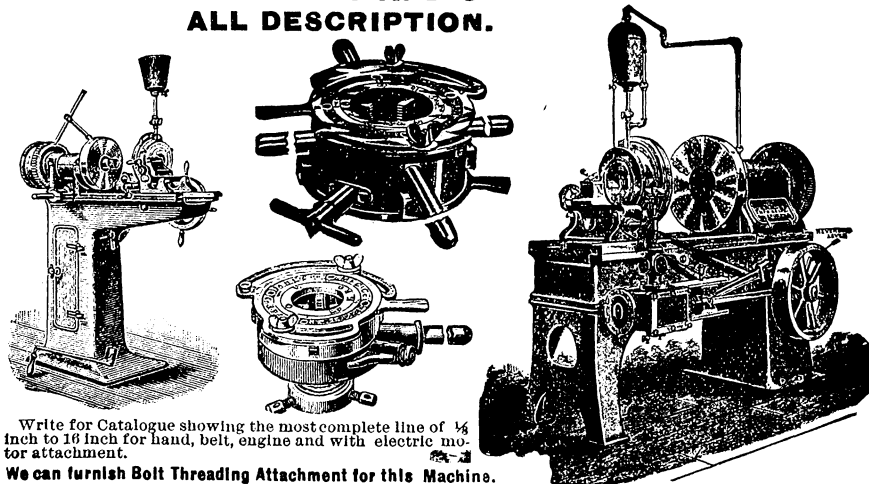
HENRY B. PANCOAST & CO.,

243-245 South 3d Street, Philadelphia, U. S. A.

ASK YOUR JOURNER WHAT HE KNOWS ABOUT THIS TOOL.

JARECKI MFG. CO. (Limited), Erie, Pa.

PIPE THREADING AND CUTTING TOOLS OF ALL DESCRIPTION.



Write for Catalogue showing the most complete line of $\frac{1}{4}$ inch to 16 inch for hand, belt, engine and with electric motor attachment.

We can furnish Bolt Threading Attachment for this Machine.

"Thou Com'st in Such a Questionable Shape."—*Hamlet*.

PERHAPS . . .

You are now making and selling something—perhaps only trying to sell it—which, while you yourself know it to be in every way desirable, yet somehow it seems to "hang fire," and for some unaccountable reason it has not so far been generally "taken up" by those best situated to handle it. **PERHAPS** I could suggest something calculated to remedy this state of affairs; or **PERHAPS** you are just about to launch upon the market something novel—something which you think ought to sell well. Perhaps, also, you are fully alive to the vital importance of having the circulars introducing it (whatever it may be) so gotten out as to be attractive (attractive of themselves, I mean). **PERHAPS** you are not, by any means, absolutely certain that in getting out your circulars it would be best for you to follow closely in the beaten track worn by your "competitors." If you have any such lingering doubts on this question, perhaps I could help you to feel still more dubious. **PERHAPS** once in a "while"—perhaps two or three times in that period—you find yourself vaguely wondering if you could not get up something novel in the advertising line, and then, of course, you proceed to ask yourself if it would not pay to do so, and forthwith stop just here—and drop "dropping the matter," why not drop me of course, this meets your eye at a specially elastic date so strongly resembling monitory symptoms of a desire for somenicate with me. **PERHAPS** you are as you are constantly throwing into your Perhaps, furthermore, you at times desire read). "Perhaps" I might be able to help mind the preparation of some little Catalogues to have "specially attractive" even PERHAPS you have just been which the public must have PERHAPS this may approach to a

PERHAPS "Sometime"—not now, for, busy moment—"Sometime," then, at that conveniently "Never"—when you are again seized with the pre-thing novel, perhaps it might then pay you to commu-satisfied that your dissatisfaction with such circulars waste-paper basket has ample grounds for its existence, such as do not gravitate in that direction—(at least un- you to such. **PERHAPS** at this very time you have in logue, Price-List, Notice or Circular, which you feel am- at the risk of its being quite unlike other people's announce- **PERHAPS** 'tis descriptive matter, setting forth the super- and So," that is floating disjointedly through your brain; or thinking that some Newspaper or Periodical Advertisement long since gotten used to, should be rejuvenated forthwith; or find you fairly "racking" your brains to compass some "fresh" subject that is so hopelessly "old" as to seem well-nigh threadbare; or to mention attractively goods that everybody is tired of hearing about already; and **PERHAPS**, so far, you have not hit upon anything that pleases you sufficiently to induce you to try its effect upon the public; or **PERHAPS** it seems as if your various competitors had already said about all that could be said truthfully (or otherwise) concerning the lines of goods in which you are interested. Perhaps, however, you may err just here, and (waiving the "cabbage-clause") this may be a case where "two heads are better than one," or **PERHAPS** you want "something," and don't even know precisely what it is you do want—something fresh, novel, striking—even a little pecu- liar, perhaps. "Peculiarities," indulged in with discretion, are often most effective; when overdone they approach the "dead-line" of absurdity, cross it, and forthwith receive their meet recompense. **PERHAPS** you are thoroughly imbued with the desirability of having everything issued by your house in the line of printed matter so uniformly meritorious as to be generally recognized by the trade as your way of "doing things." (Perhaps, however, you are not "imbued"—a bit.) **PERHAPS** none of the situations hereinbefore suggested have ever materialized in your case; but **PERHAPS** one or more of them may at some future time. In which event **PERHAPS** you will not be unwilling to recall the circumstance that the Author of **PERHAPS** makes of the preparation of Commercial Lit- erature the serious business of his life, and that he will be pleased to correspond with any seeking aid in this direction on either side of the Atlantic Ocean. **PERHAPS** you are somewhat impressed with the very considerable amount of matter that has been gotten into the shortest form of question the English language furnishes, and **PERHAPS** you may feel curious to learn more of the "Condenser," and, furthermore, of his views on "enlarging," as applied to divers adver- tising matters. **PERHAPS**, then, if you should write to him, and request that certain circulars issued by him be sent you, peradventure your outlay for postage, etc., might not be re- garded by you as money altogether wasted. **PERHAPS**, however, this is a matter that cannot be absolutely determined in advance of such experiment. Circular No. 2 treats of the Trade Circular, while No. 9 deals with a few phases of Newspaper and Periodical Advertising, and, perhaps, they will be mailed you upon ap- plication.

At 326 Chestnut Street,
Philadelphia, U. S. A.,

FRANCIS I. MAULE

Undertakes the preparation of Commer- cial Literature, in the practically endless ramifications by which ink and paper are made to subserve man's purposes of gain —such as

Newspaper and Periodical Advertisements, Trade Circulars, Price Lists, Catalogues, Circular Letters, Announcements, Fold- ers, Trade Primers, Notices, and so on "Ad infinitum."

At the above-mentioned address he will be pleased at any time to consult, or corre- spond with, parties interested in such subjects, or matters kindred thereunto.

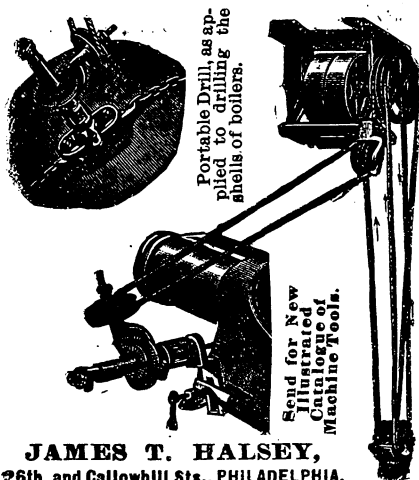
FRICITION CLUTCHES, SHAFTING, HANGERS, PULLEYS.

Sheaves for Rope Driving.
Gear Wheels.

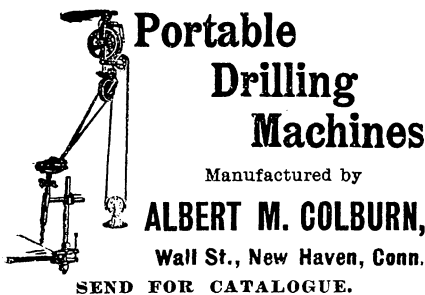
FRICITION PULLEYS.

KEYSTONE CLUTCH AND MACHINE WORKS,

1708-1710 Germantown Ave.,
PHILADELPHIA, PA.



JAMES T. HALSEY,
26th and Callowhill Sts., PHILADELPHIA.

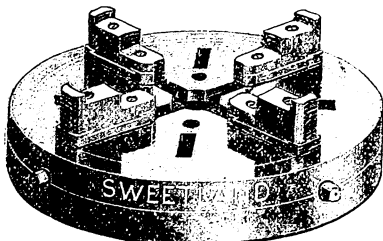


REECE'S PATENT HAND BOLT CUTTER OR SCREW PLATE.

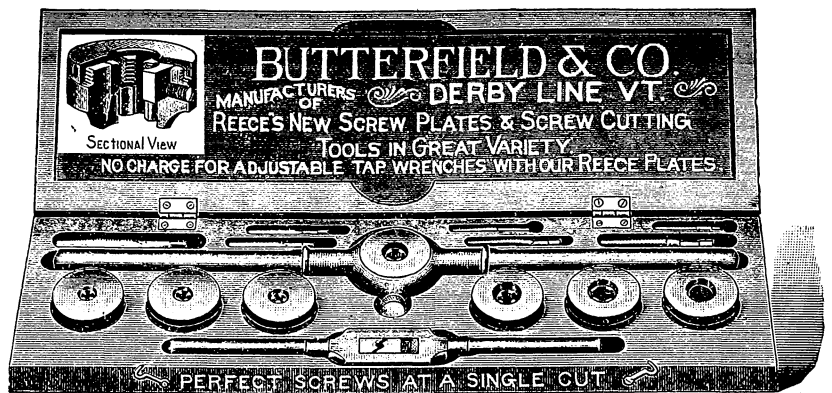
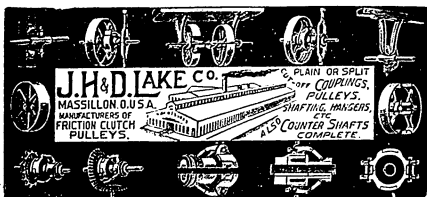


Send for new catalogue of
SCREW CUTTING TOOLS.
EDWARD F. REECE, Mfr., GREENFIELD, MASS.

THE BEST IN THE MARKET.
THE SWEETLAND CHUCK. Reversible Jaws.



The Hoggson & Pettis Mfg. Co.,
NEW HAVEN, CONN.
SEND FOR CATALOGUE.



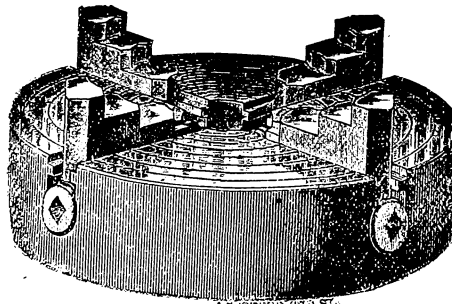
CUSHMAN CHUCKS.

We have recently improved our full line of Geared Scroll Chucks and have also added a 10½ inch and a 15 inch. Prices and discount on application.

Send for our catalogue of all kinds of Lathe and Drill Chucks.

The Cushman Chuck Co.,
Hartford, Conn.

CHAMPION INDEPENDENT CHUCKS.



An entirely new line of small Chucks, provided with 3 or 4 independent reversible steel jaws. The best Chuck in the market for foot lathes. Ask your dealer for them or write to us.

THE D. E. WHITON MACHINE CO.
Sole European Agents SELIG SONNENTHAL & CO., London. New London, Conn.



Three styles of Screw Plates **BUILT ENTIRELY ON HONOR**, with prices to suit all. Write for catalogue.

CHAMPION BLOWER & FORGE CO., - - - **LANCASTER, PA.**



THE ADJUSTABLE
"DUPLUX" DIE STOCK.
Quick. Accurate. Durable.
15,000 now in use.

HART MANUFACTURING CO.,
CLEVELAND, O., U. S. A.

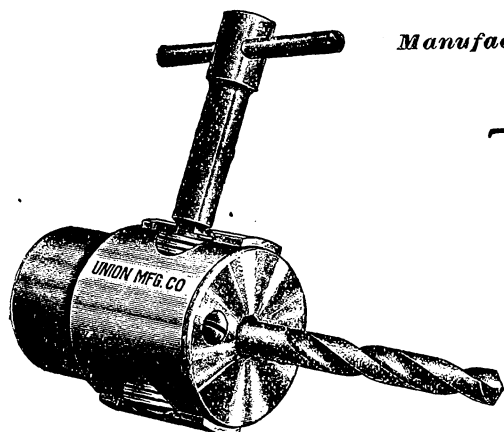


UNION MANUFACTURING COMPANY, NEW BRITAIN, CONN.

WAREHOUSE, 103 CHAMBERS ST., NEW YORK.

Manufacturers of Combination, Universal, Independent, and Combination Reversible Jaw Chucks.

THE UNION DRILL CHUCK.



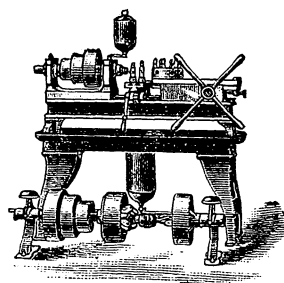
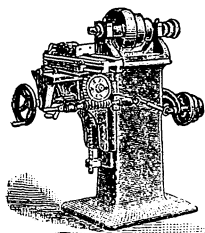
NUMBER.	DIAMETER.	HOLDING.	LIST.
000	1 1/4 inches.	0 to 1/4 inch.	\$7.00
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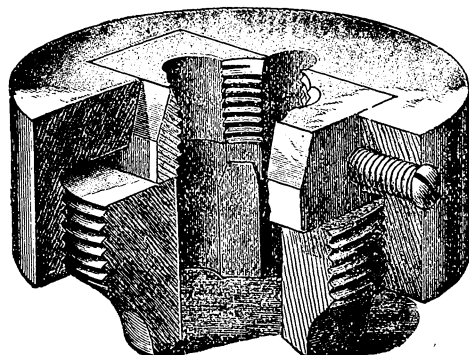
Manufacture forging and finishing machinery with dies, fixtures, milling cutters and gauges, for the manufacture, on the American system of interchangeability of parts, of fire arms, sewing machines and bicycles: Machines and tools for finishing brass in the forms of gas fixture joints and keys, locomotive fittings and plumbers' goods, as well as studs, screws and pieces of irregular outline of circular cross section in iron, steel and other metals. Manufacturers also of single and double head milling machines, used as substitutes for planers for heavy and rapid cutting in cast iron and steel. Circular milling machines for finishing grooves of sheave pulleys, faces and sides of large gear blanks.

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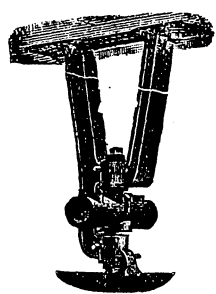
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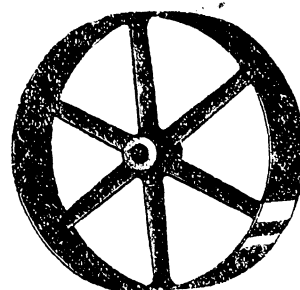
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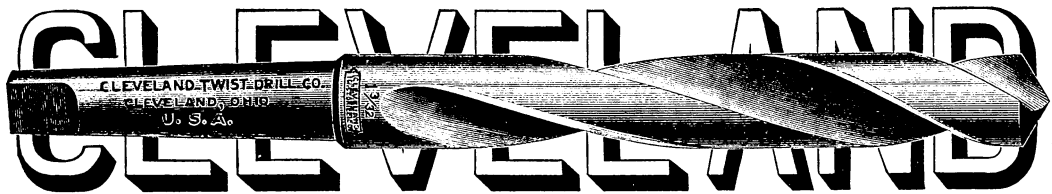
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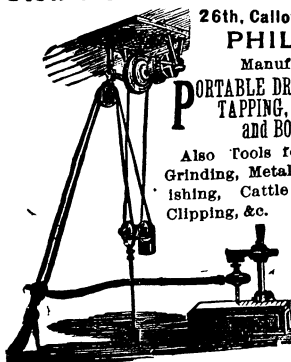
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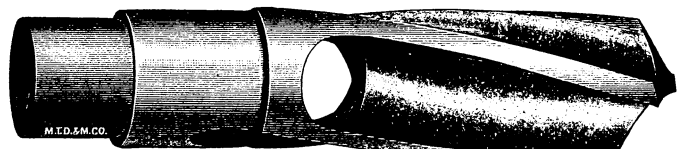
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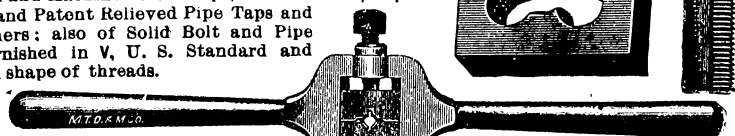
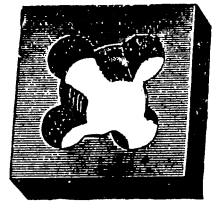
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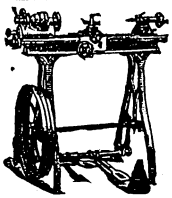
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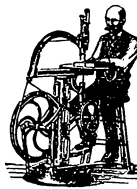
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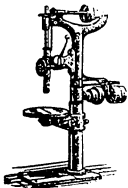
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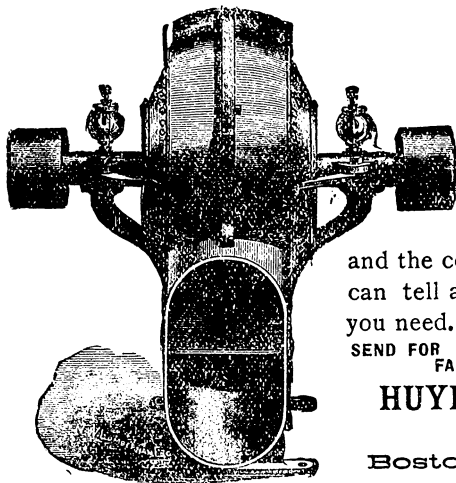


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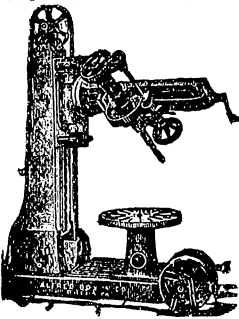
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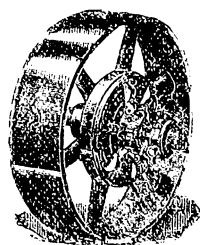
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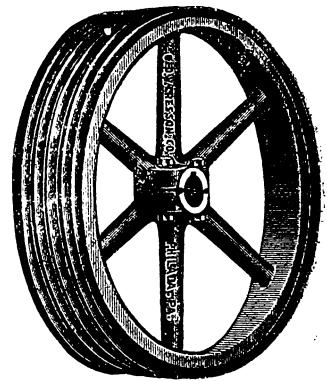
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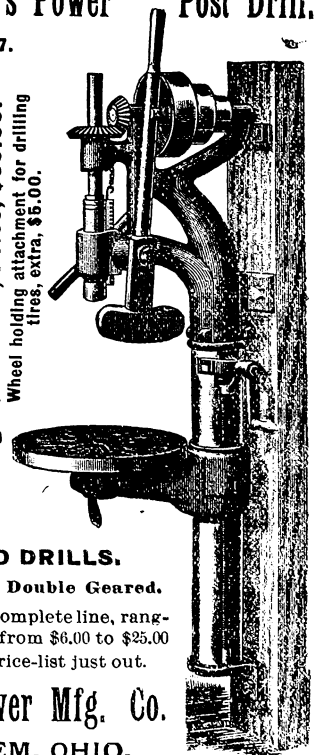
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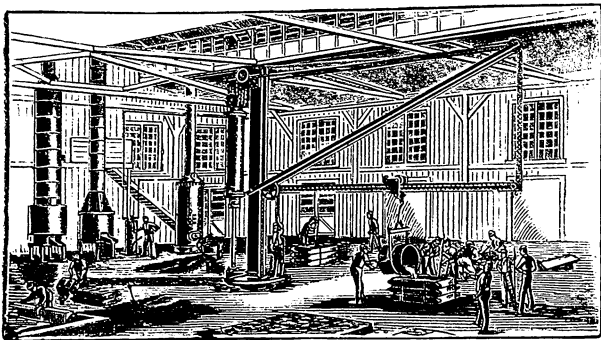
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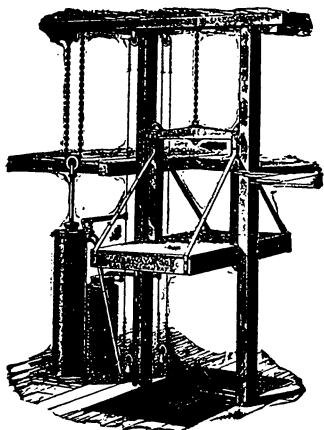
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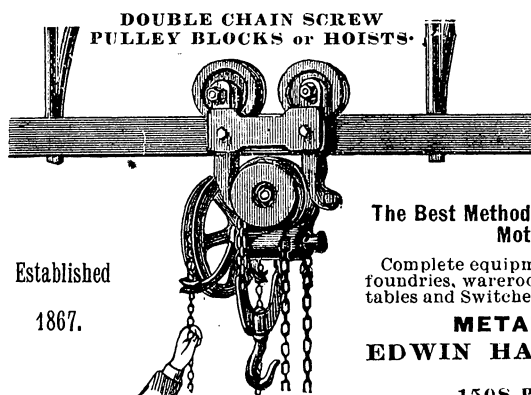
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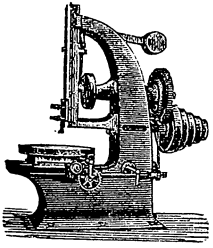
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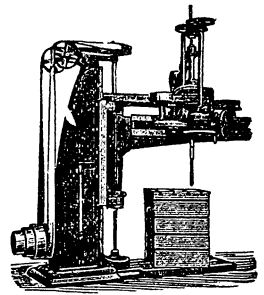
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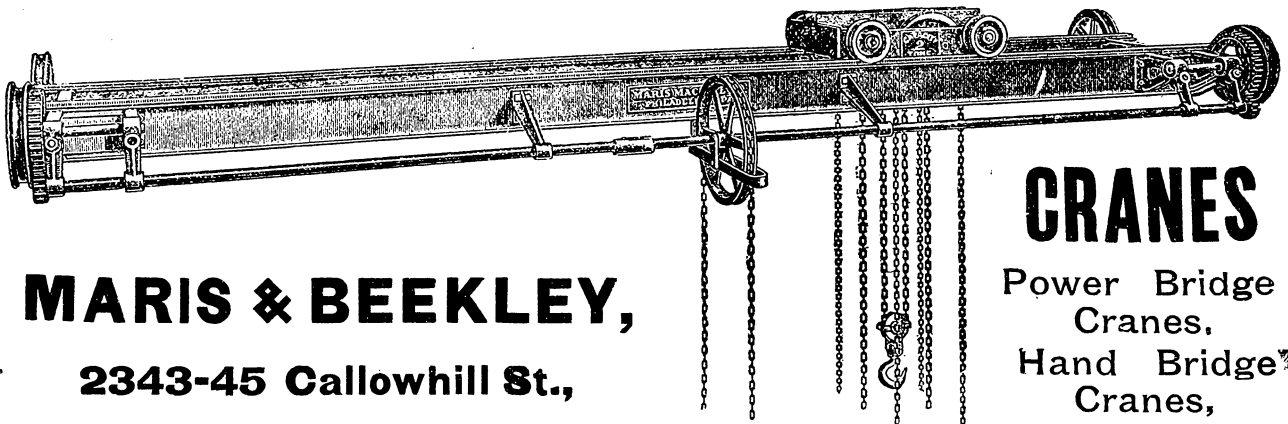
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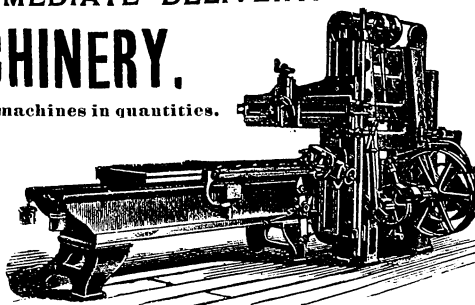
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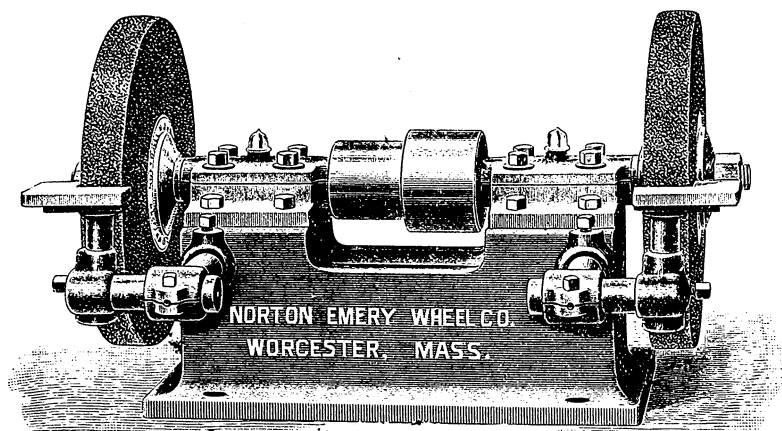
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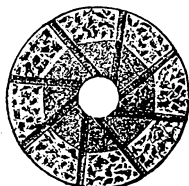
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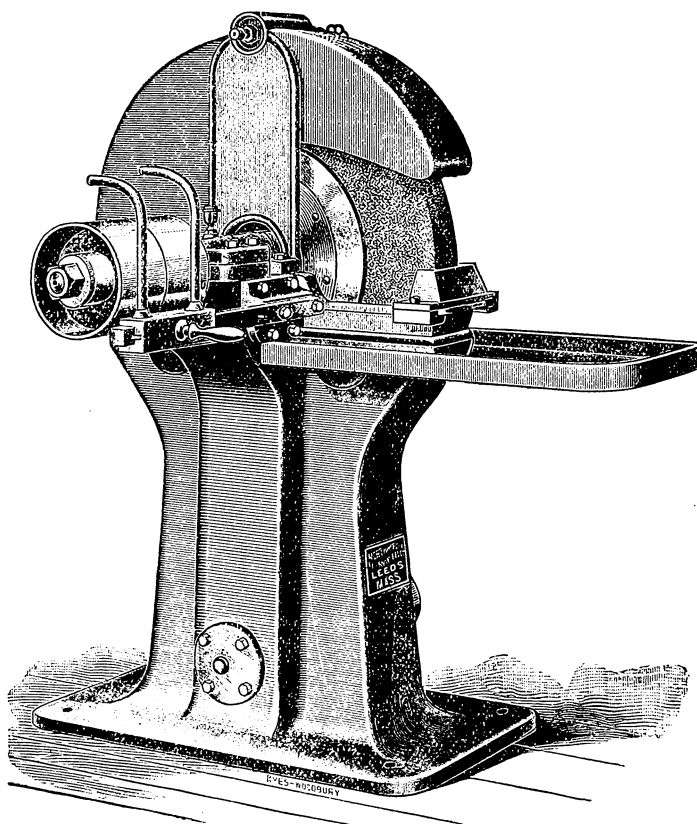
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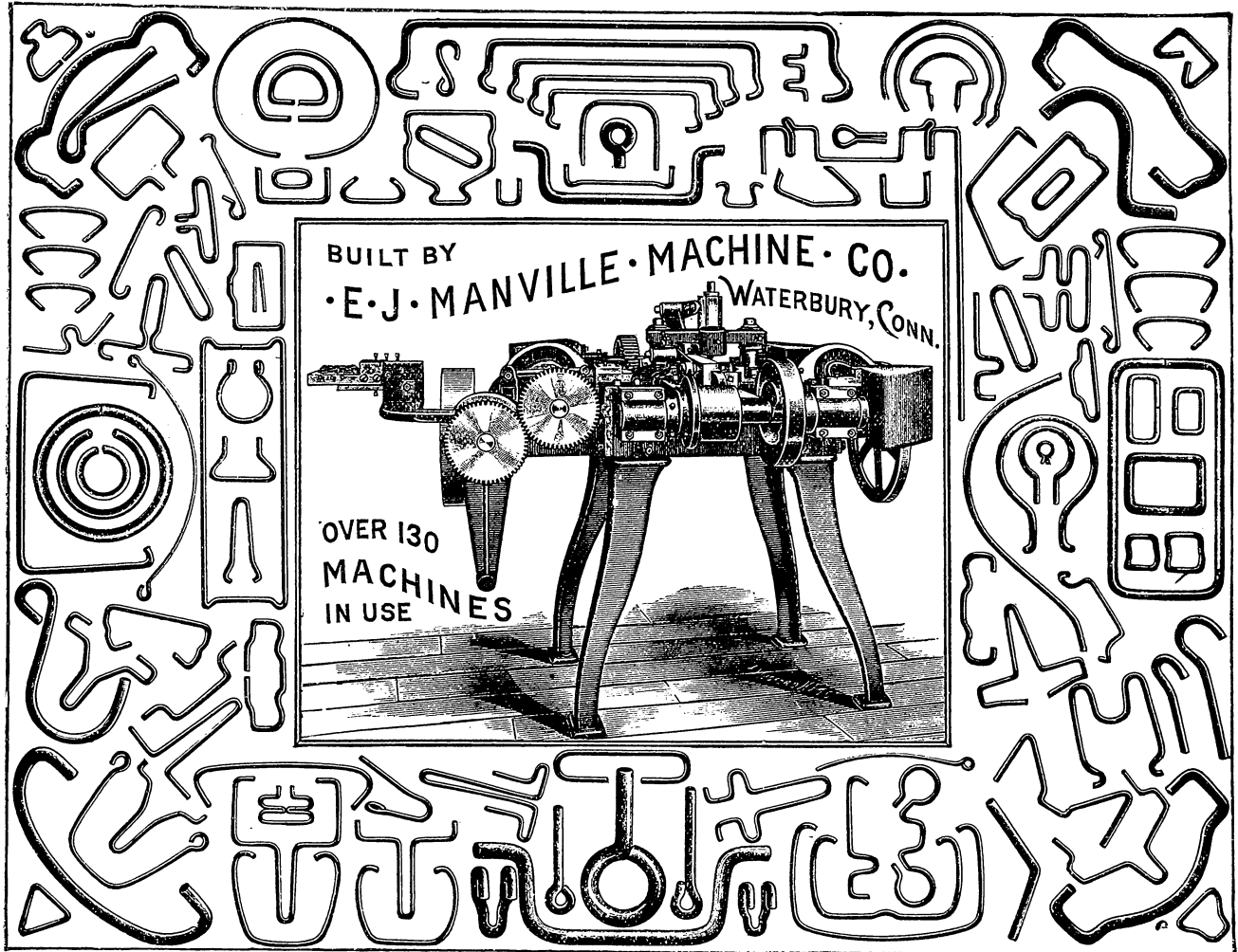
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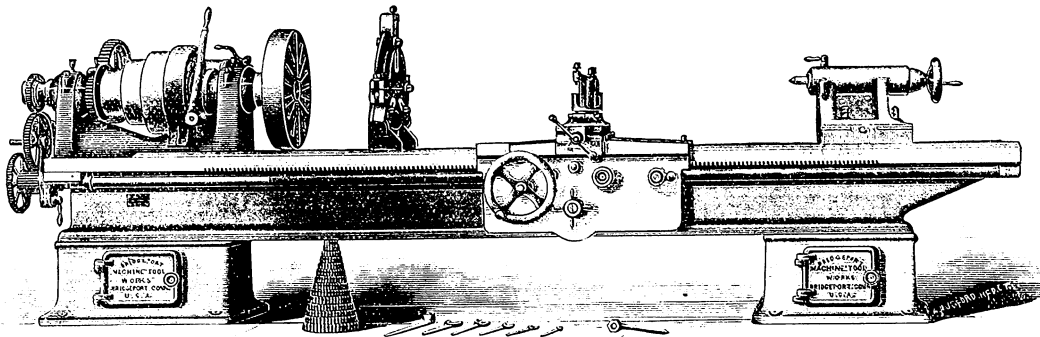
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93-INCH Throat HYDRAULIC RIVET-
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Magnetic Separating Machine, Dynamo for Electro-
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Gang Drills, 2 Spindle and 4 Spindle.
Lot of Special Drills for Butt Drilling.

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Lot of Polishing Mch., Leather Covered Wheels, etc.
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TWO OF THEM; SECOND HAND.

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Weight complete, 2600 lbs.

Back Geared and Power Feed, Quick Return,
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A full line of the most improved Turret Lathes, and
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24 x 48 Miller & Allen Corliss Engine.
16 x 36 Slide Valve Engine.
16 x 24 " " " New.
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One American Tool Co.'s No. 2 Cabinet Turret Lathe, with slide rest. In fine order.

One Pratt & Whitney 36-in. Gap Chucking Lathe.

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3 10 in. Garvin.
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Knowles Independent Condenser for 350 H.-P. Barr
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Corliss.	High Speed Auto.	Horizontal Slide Valve.	Vertical Slide Valve.
10 x 20	11 x 20	9 x 24	20 x 24
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Lathes, 52 in. swing by 41 ft., 54 in. swing by 22 ft., 30 in. swing by 22 ft. One Pit Lathe.
Planers, 54 in. wide by 20 ft., 36 in. wide by 13 ft.
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The plant is about three years old, and is fully equipped for the manufacture of cold saws and cold sawing machines. It has a frontage of over 300 feet on P. R. R., with a depth of 100 feet and a new side track, affording excellent shipping facilities. The main building, brick and frame, with stone foundation, is about 90 x 60 feet, and a large frame storage house stands about 50 feet from main building.

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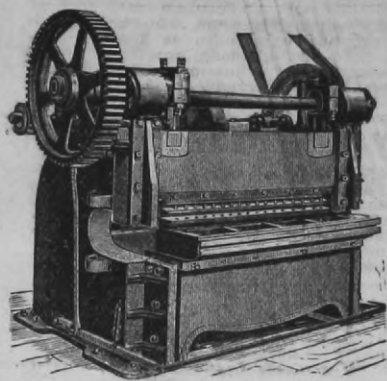
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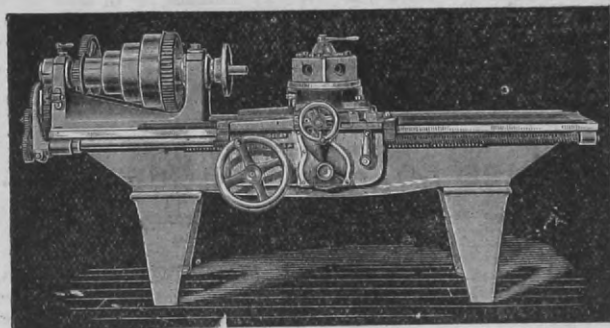


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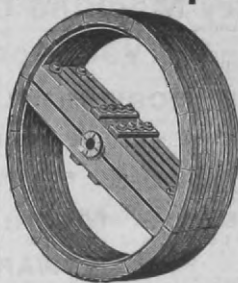
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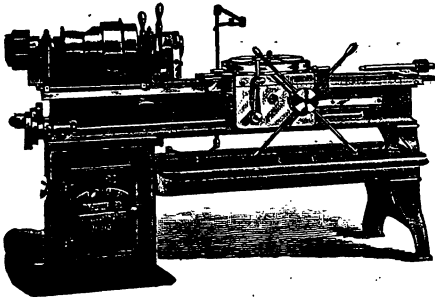
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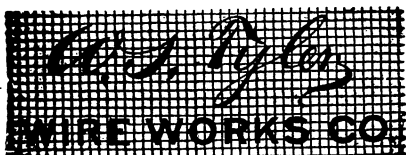
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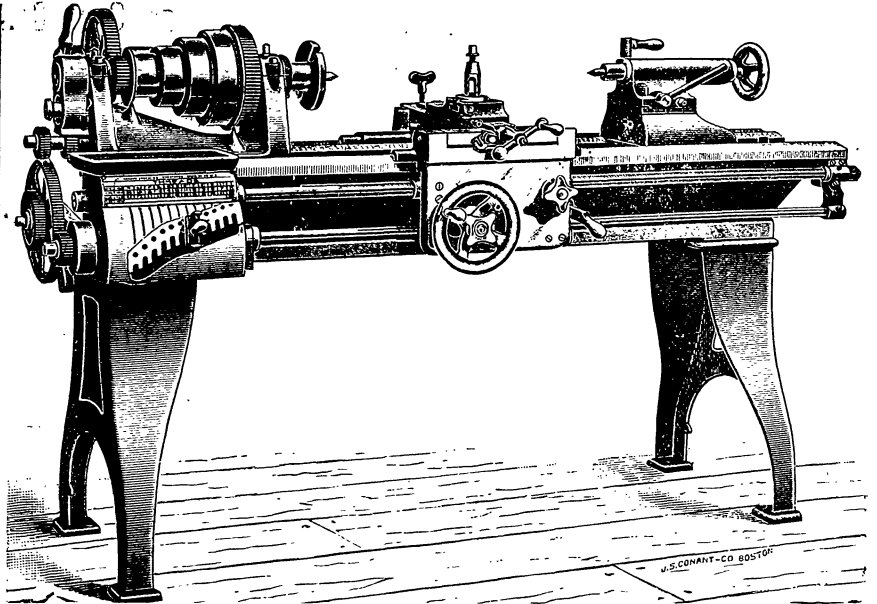
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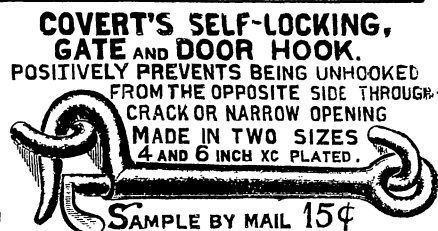


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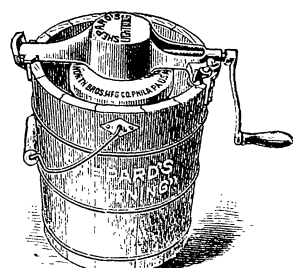
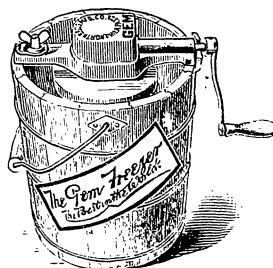
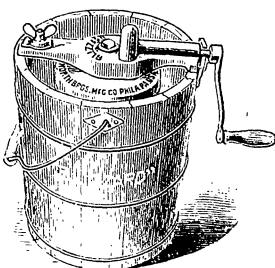
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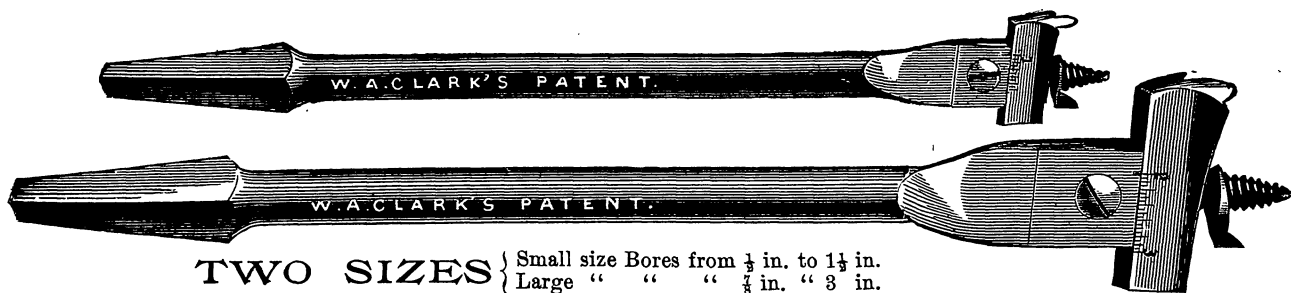


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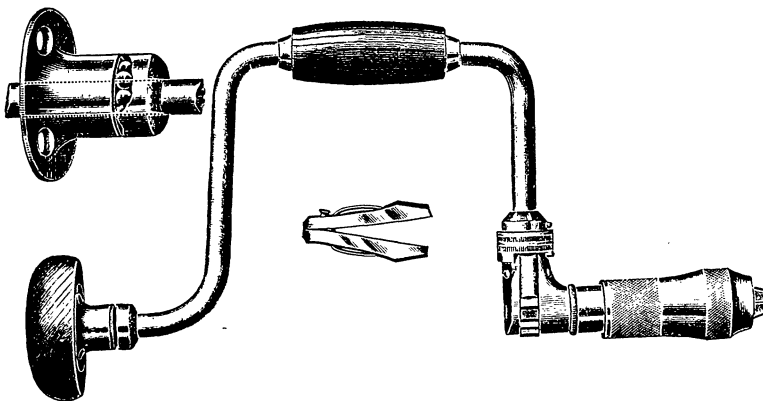
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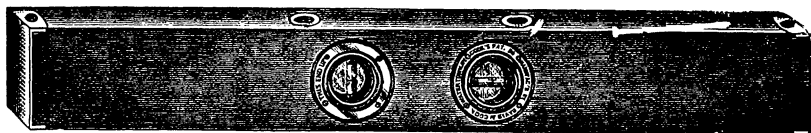
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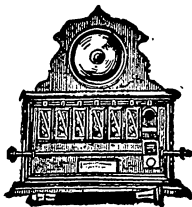
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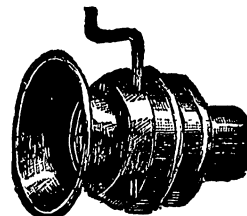
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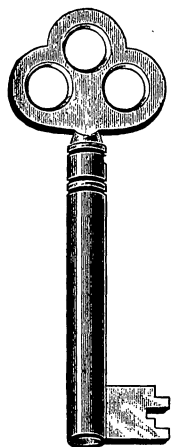
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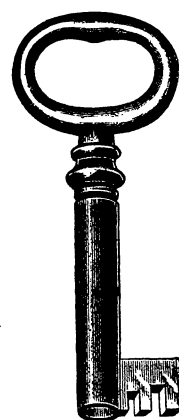


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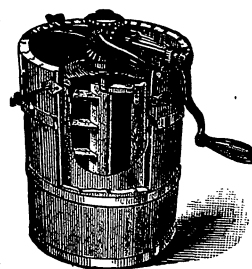
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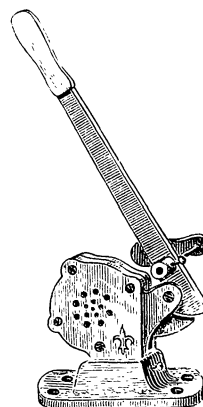
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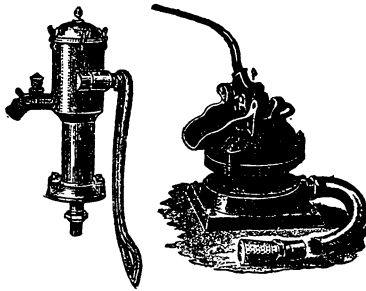
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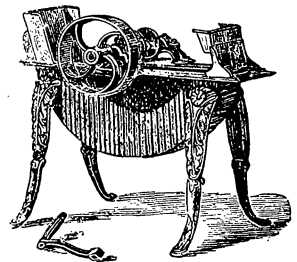
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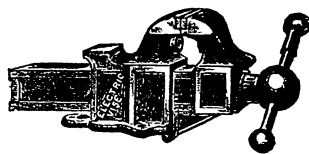
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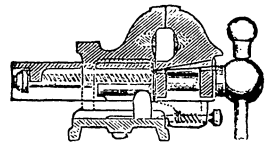


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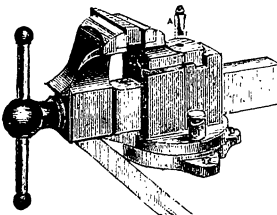
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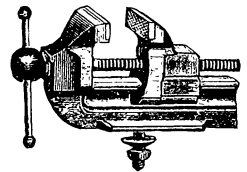
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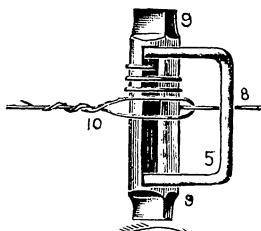
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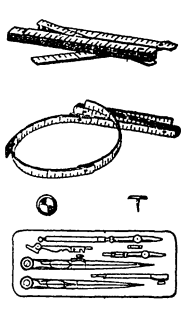
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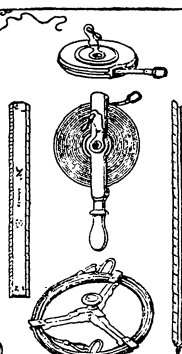
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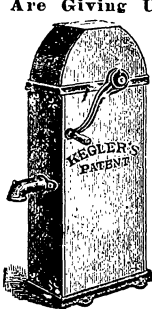
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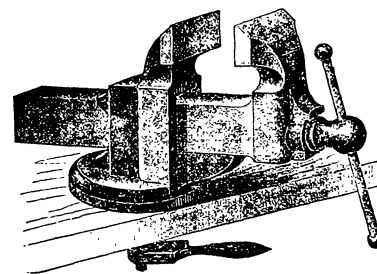


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WENTWORTH'S PATENT NOISELESS SAW VISES,

WITH RUBBER CUSHIONED JAWS.

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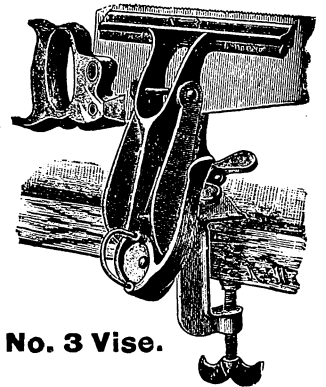
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No. 1 (11 inch Jaws),	\$15.00
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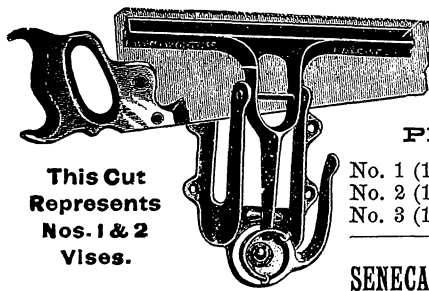
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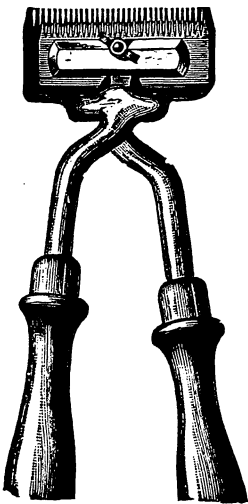
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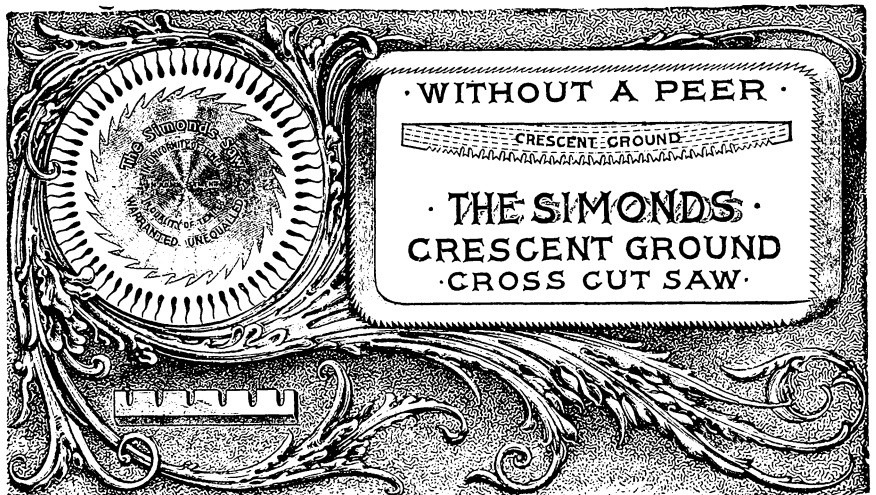
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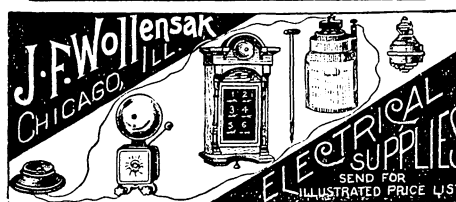
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FITCHBURG, MASS. CHICAGO, ILL. SAN FRANCISCO CAL. PORTLAND, ORE.

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Mechanics are now inquiring for this tool, and Hardware Dealers should have them in stock, or at least have a sample.

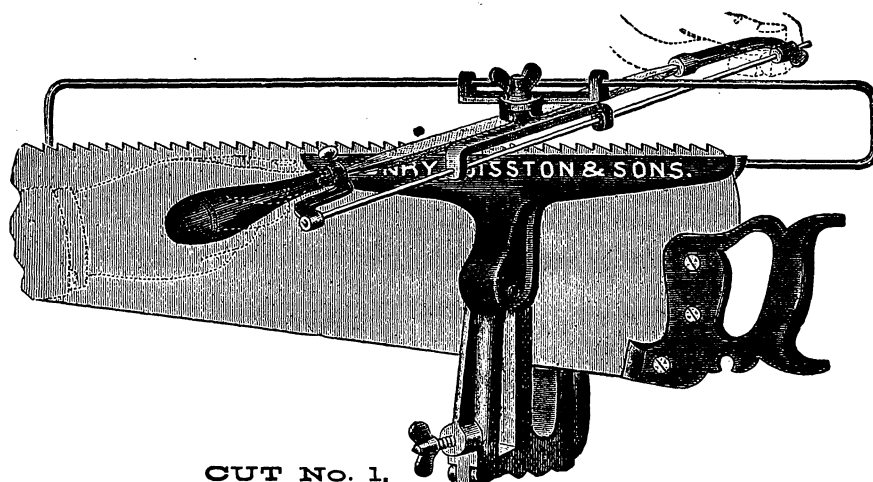
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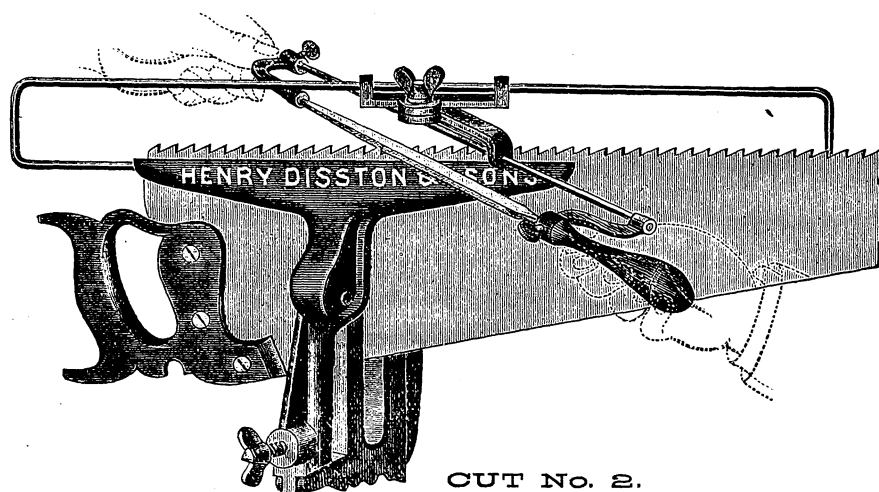
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ESPECIALLY DESIGNED TO ASSIST THOSE NOT SKILLED IN THE ART
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Cut No. 1 shows a saw and the attachment in proper position for filing the first side; and Cut No. 2 shows the saw and attachment reversed and in position to file the second side. There are three marks on one of the hubs of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position No. 1, and the other designates when it is in position as shown in No. 2. The third, or centre, marks show when it is in position for filing Rip Saws.



CUT No. 2.

To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.

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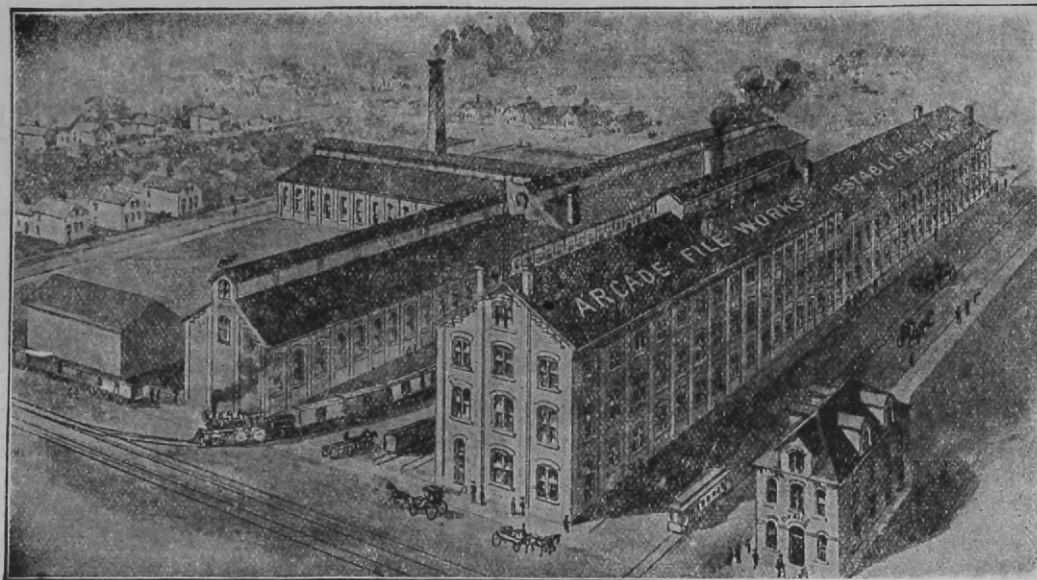
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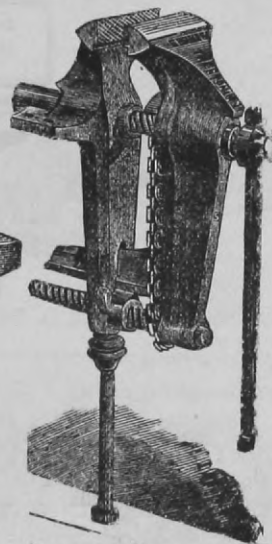
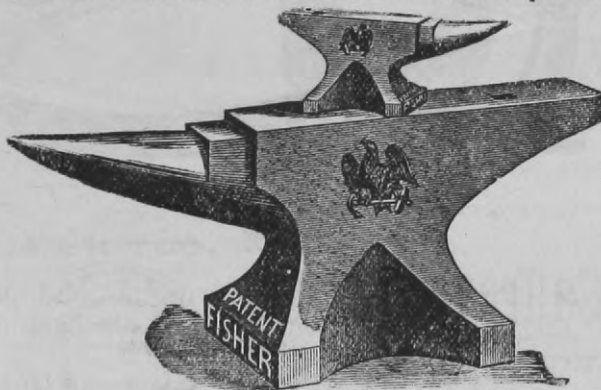
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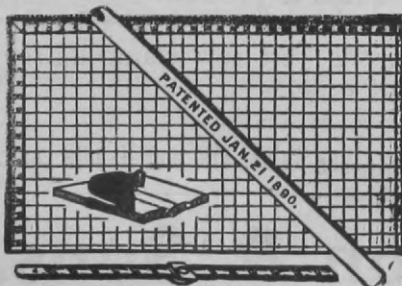
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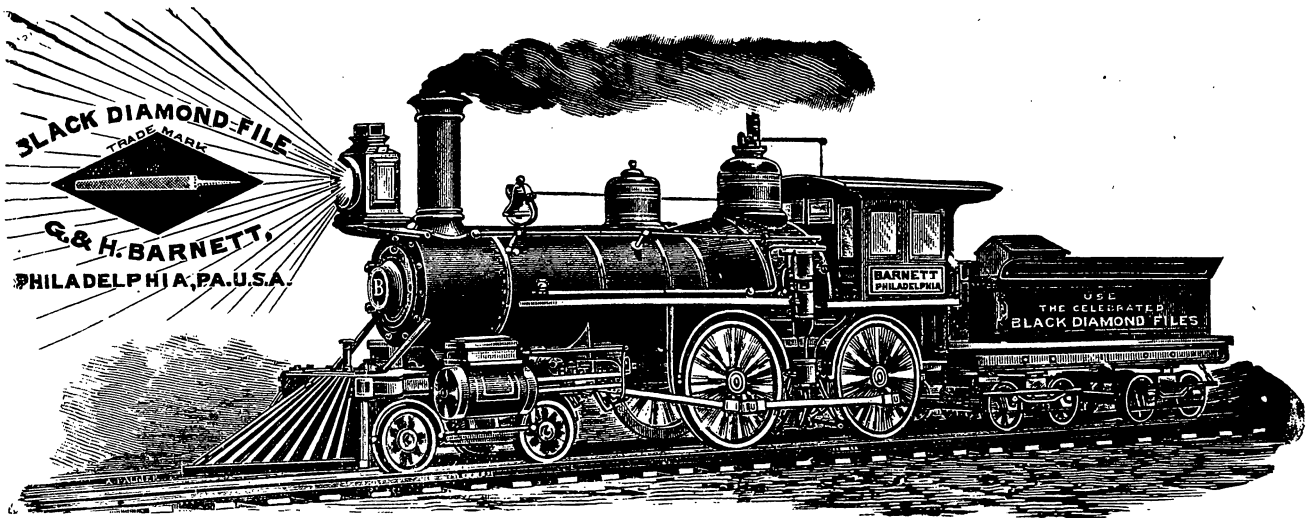
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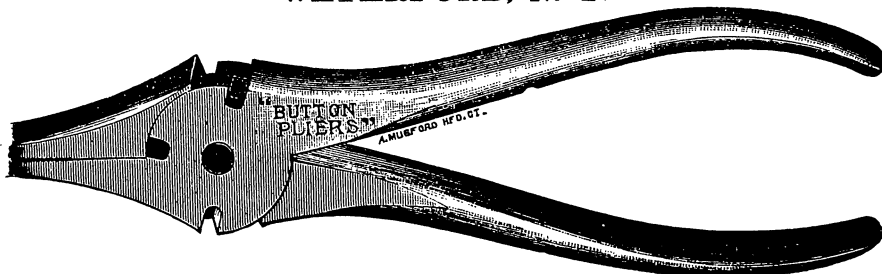
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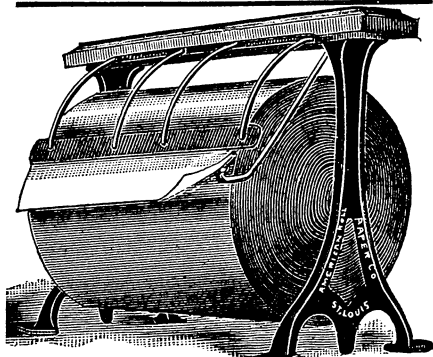
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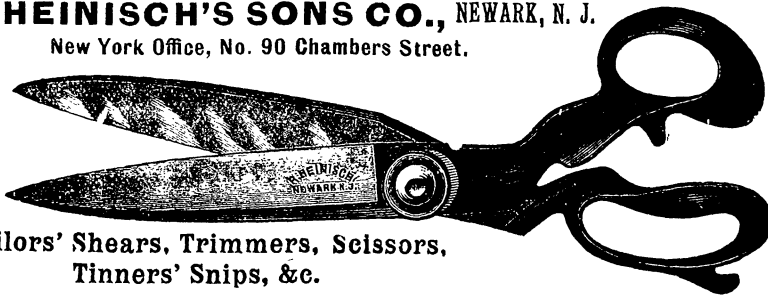
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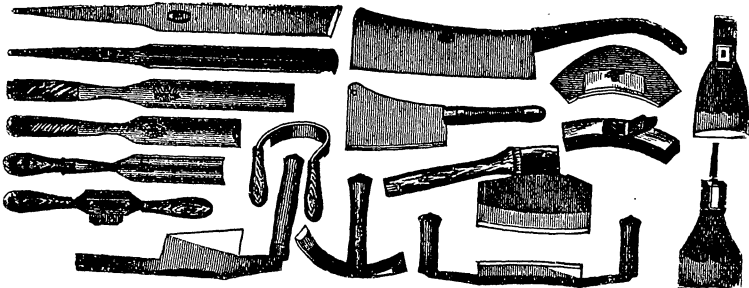
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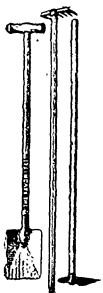
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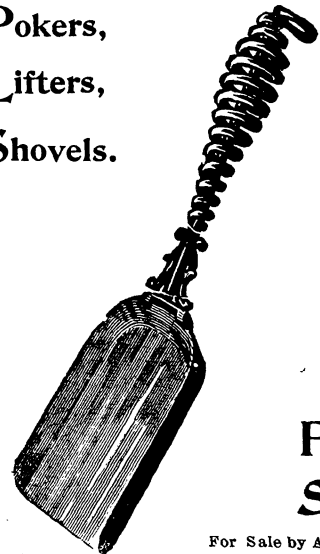
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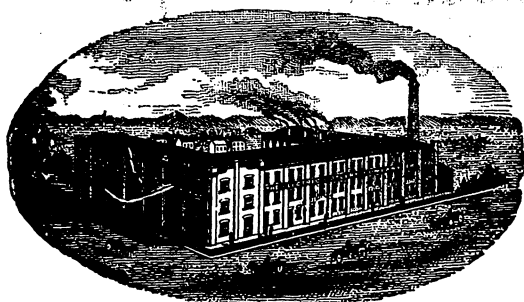


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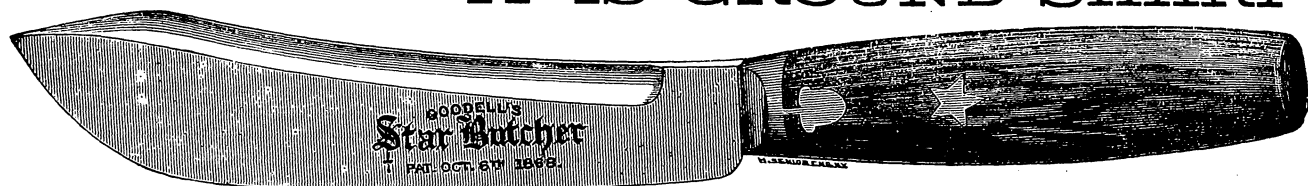
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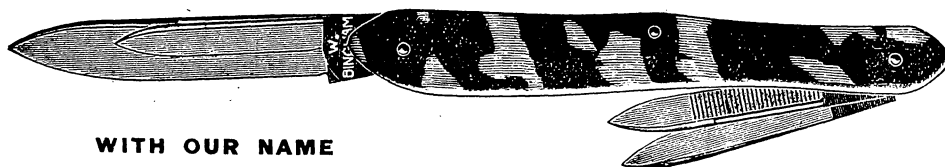
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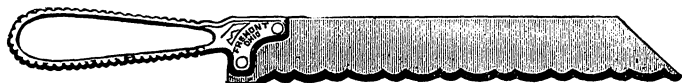
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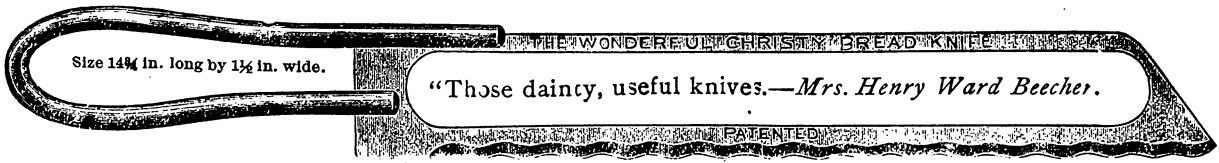
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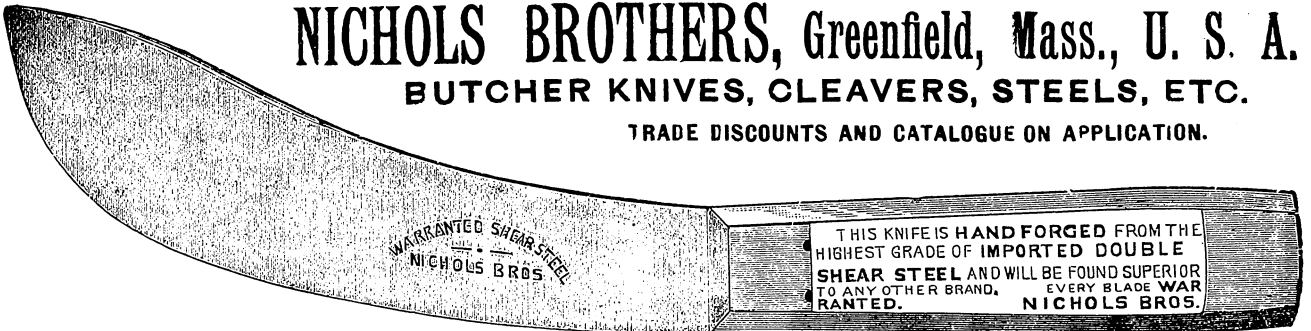
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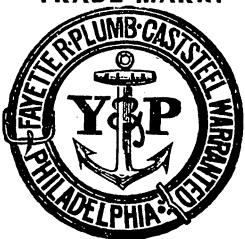
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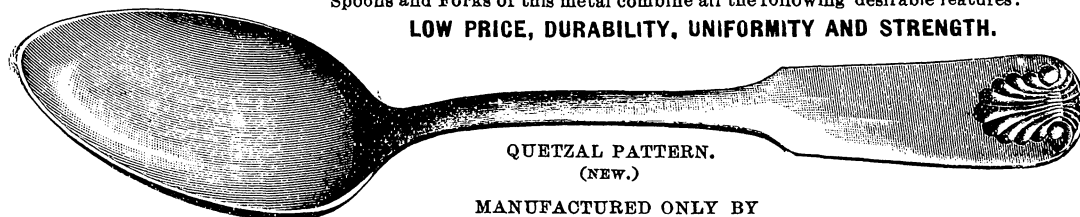
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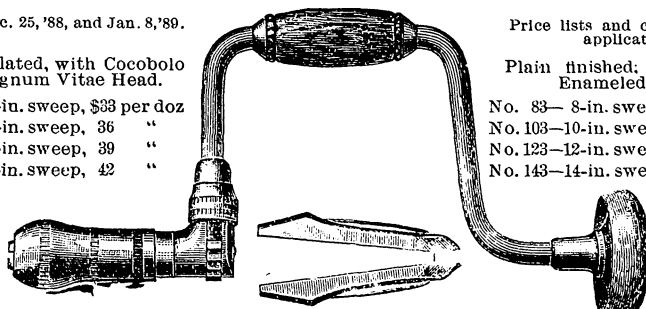
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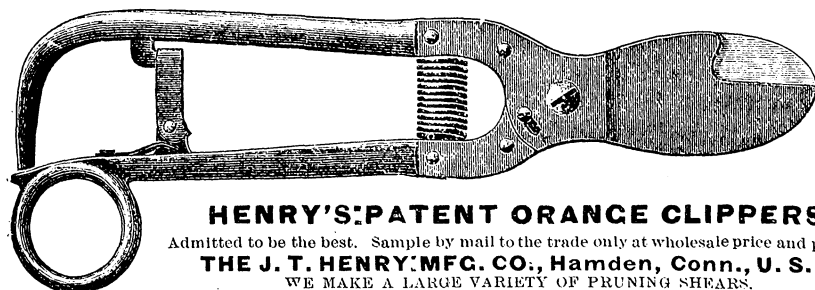
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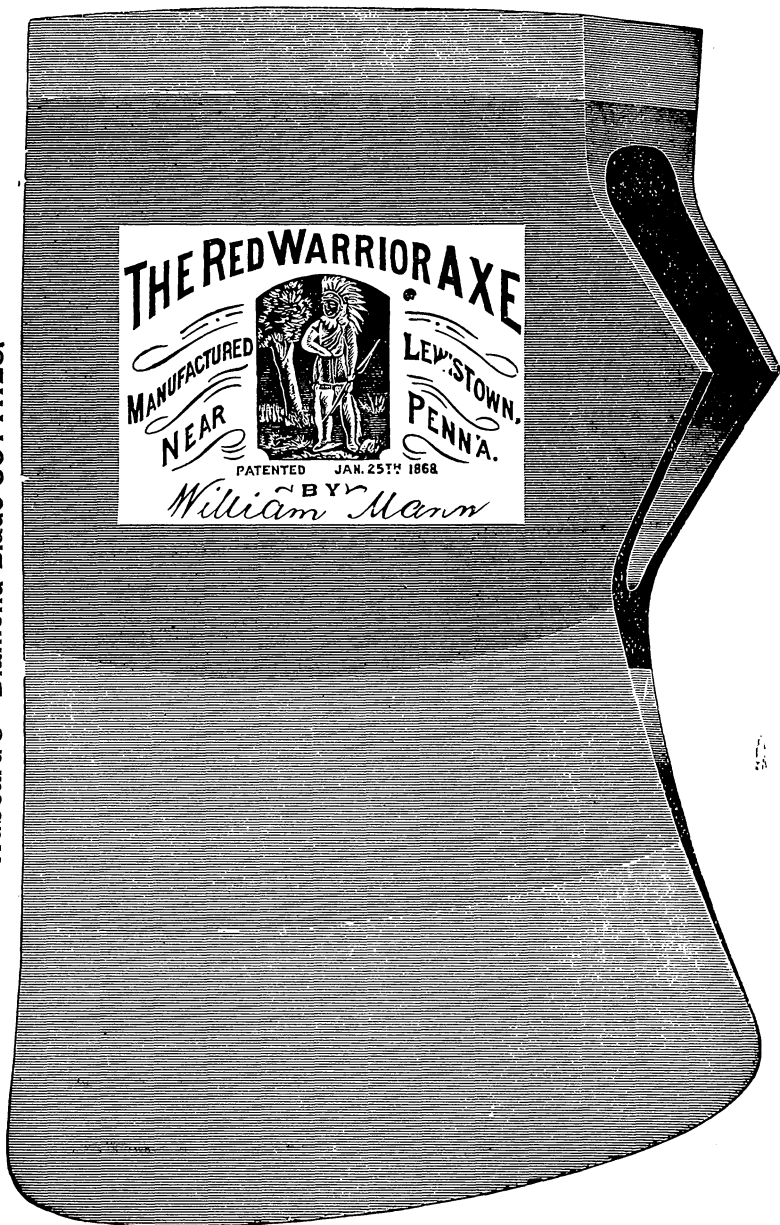
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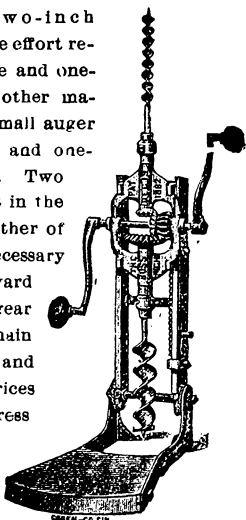
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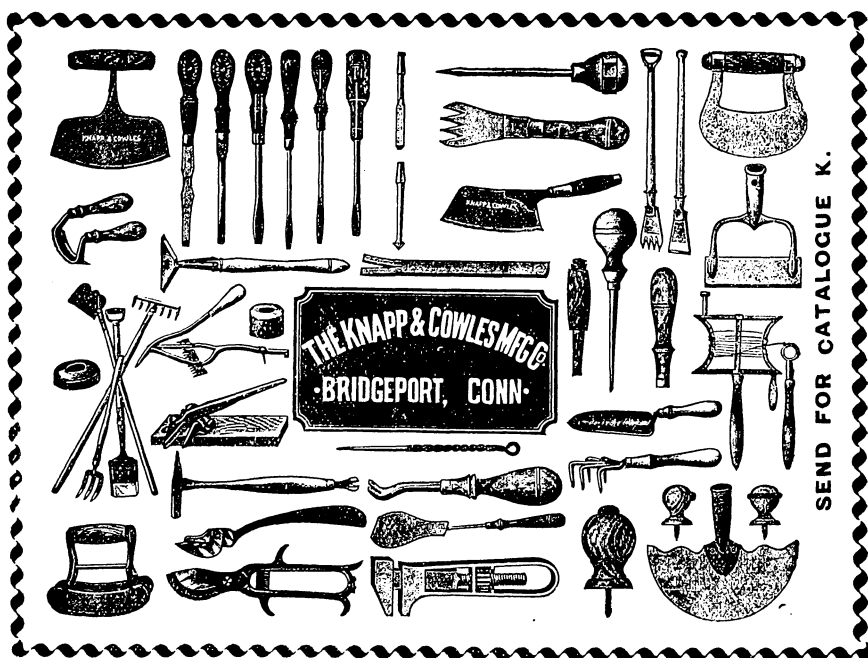
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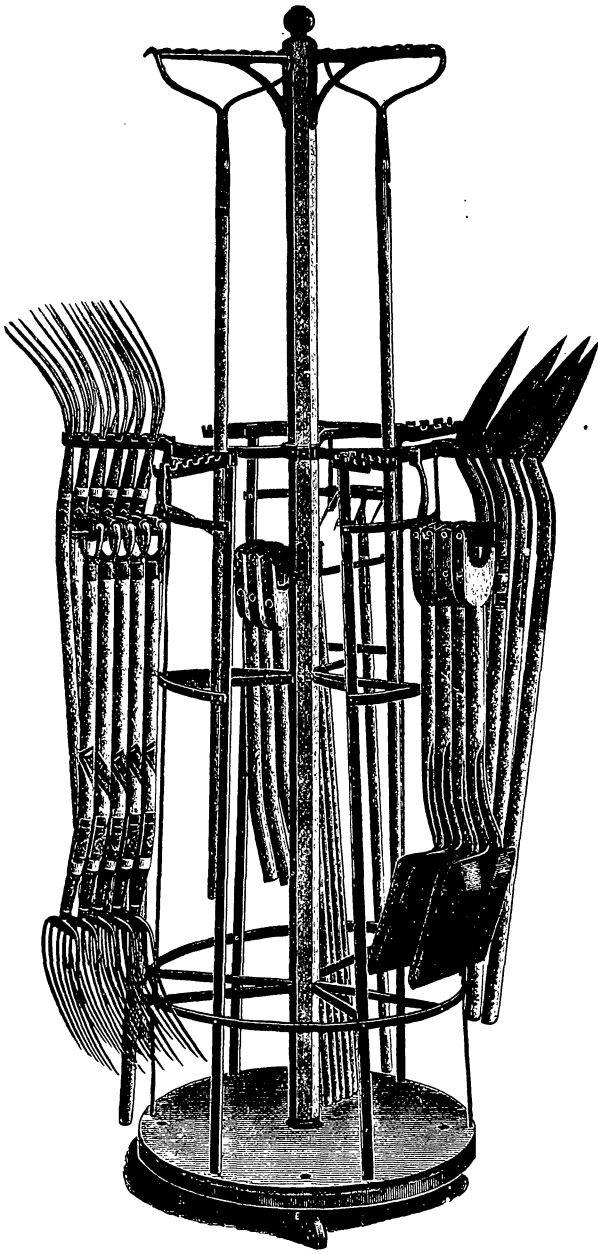


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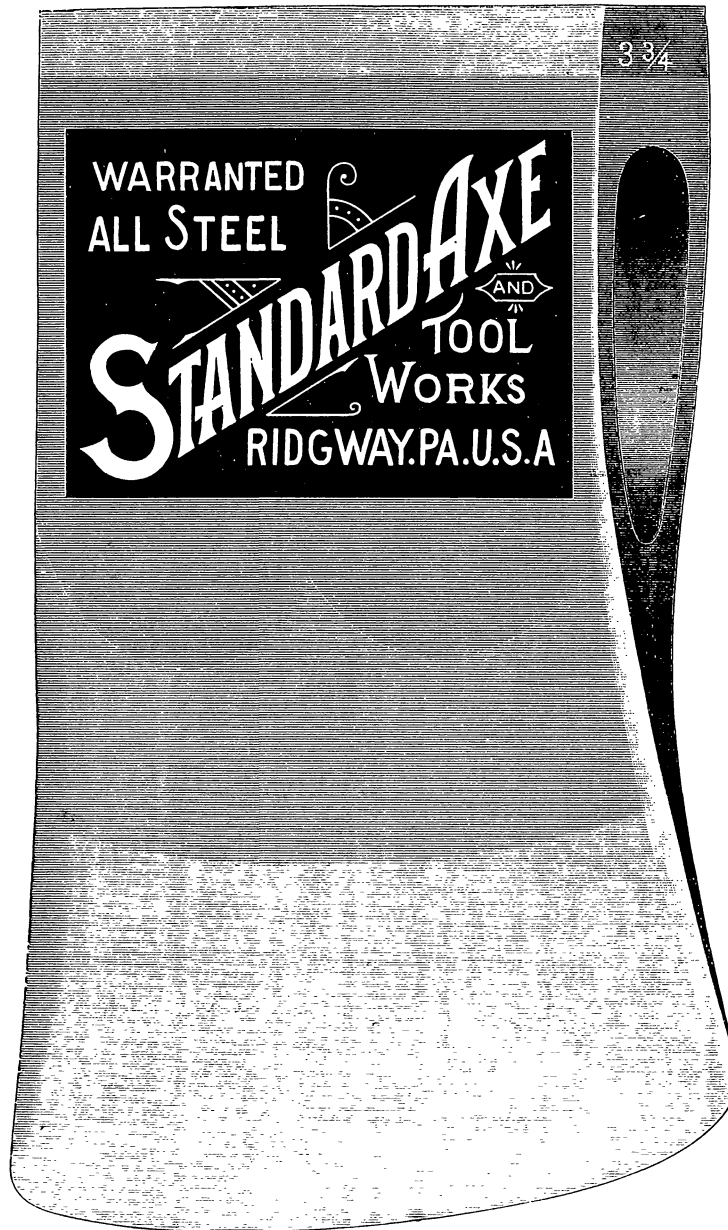


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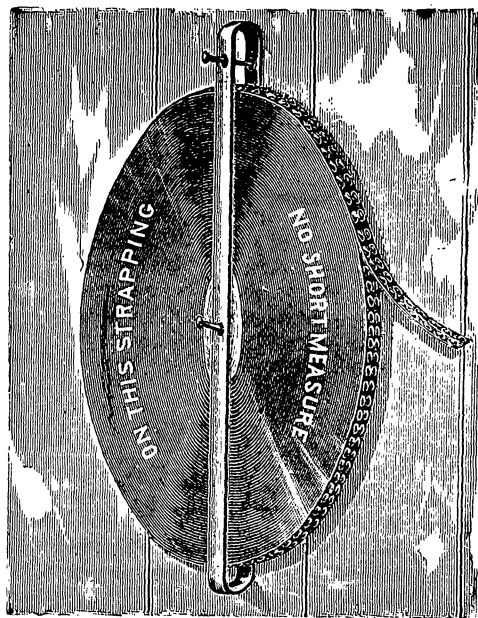
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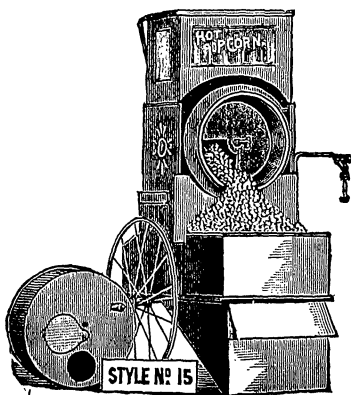
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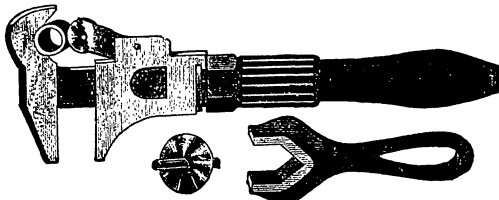
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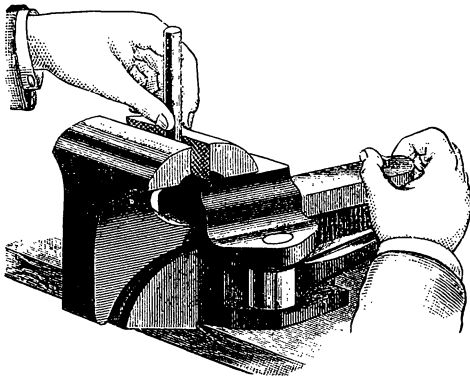
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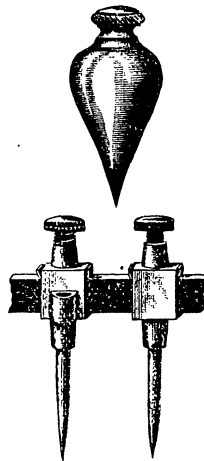
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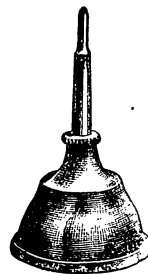
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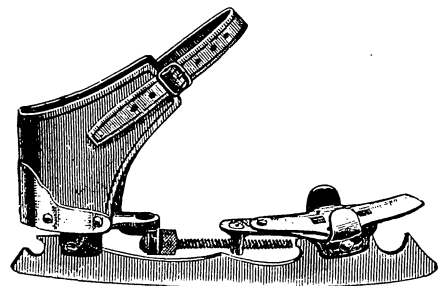
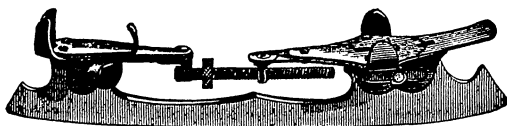
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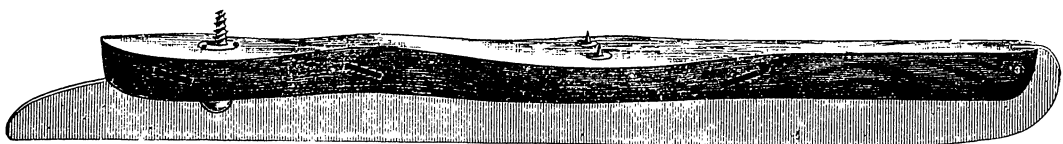
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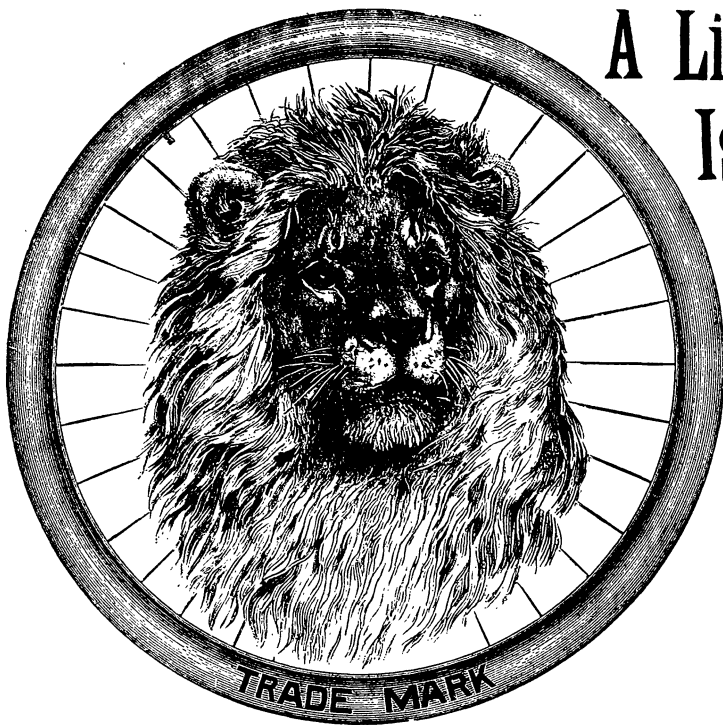


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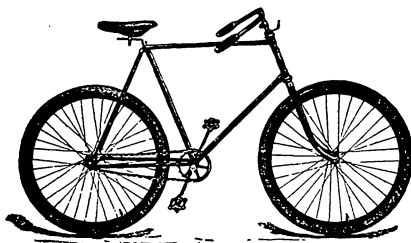
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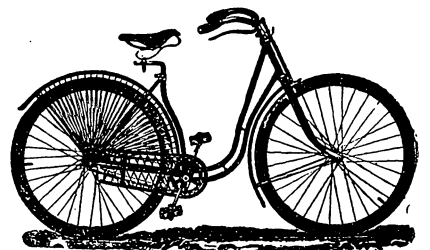


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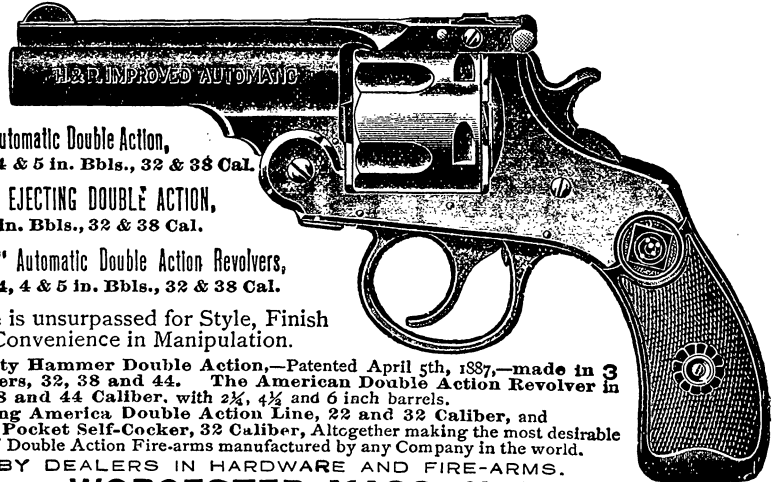
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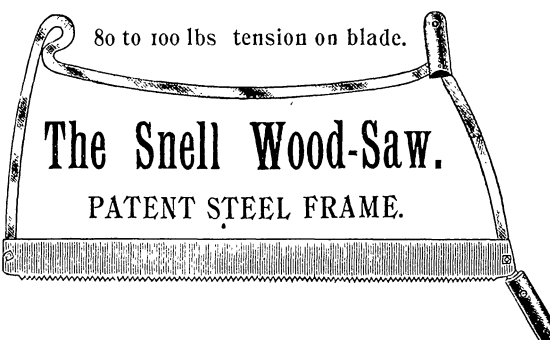
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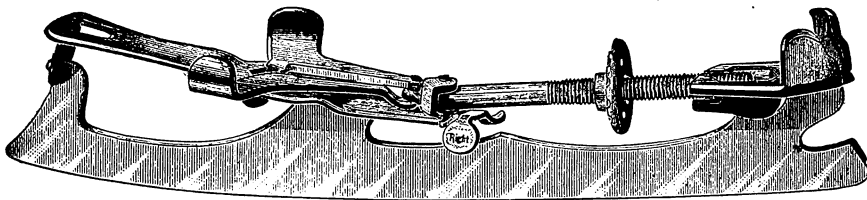
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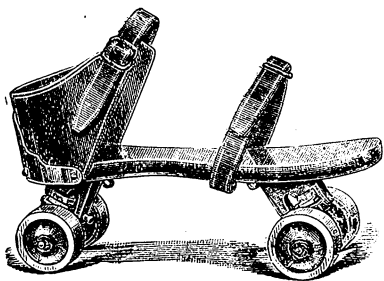
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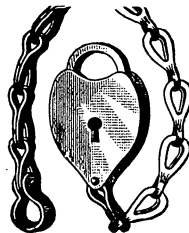
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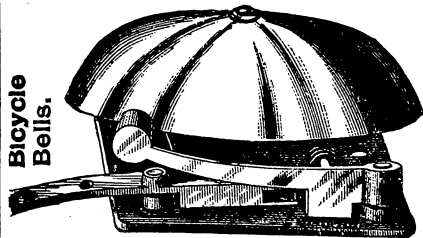
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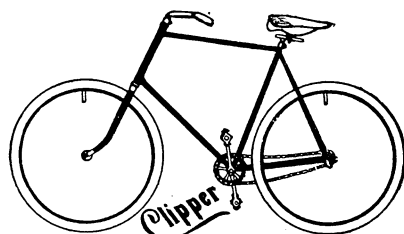
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STERLING CYCLE WORKS.

234 Carroll Ave., CHICAGO.

IMPROVED EDITION OF THE IRON AGE HARDWARE PRICE BOOKS.

Arranged by R. R. WILLIAMS, Hardware Editor of the Iron Age.

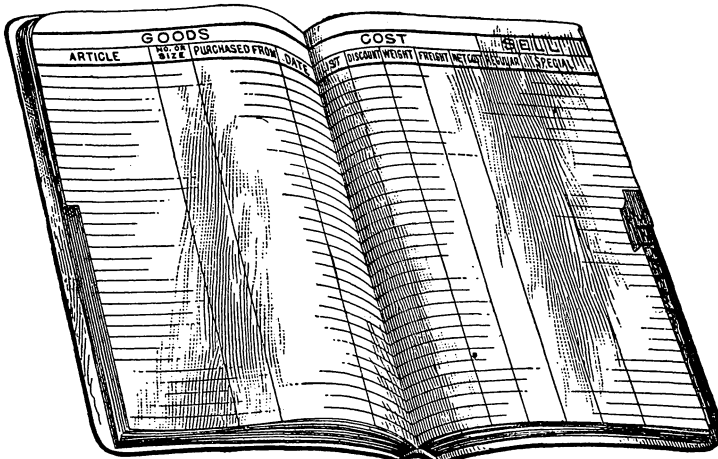
These Books are printed on paper of superior quality and bound in grain seal leather.

Columns are provided for the name and number or size, for noting from whom purchased, date of quotation or purchase, list and discount, and for entering freight expenses as an element of cost. Under the heading of selling prices, the regular and any special price, or remarks in regard to the goods are given place. This book goes into considerable detail in describing the goods and cost prices. It has been arranged in accordance with the views of many Hardwaremen whose methods are careful and exact.

Size, 4 x 7 in.; grain seal leather.

FOUR EDITIONS:

A, 200 pages,	-	-	-	-	-	\$1.00
A F, 200 pages with flap,	-	-	-	-	-	1.25
A 2, 400 pages,	-	-	-	-	-	1.50
A F 2, 400 pages with flap,	-	-	-	-	-	1.75



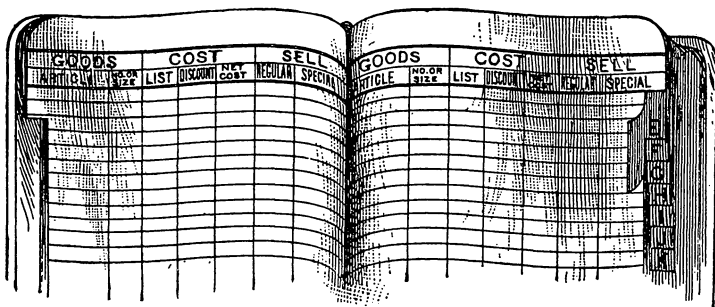
Hardware Price Book A.

In this book each page is complete, and the record of prices does not, as in Book A, run across two pages. Thus it accommodates a larger range of goods with much less detail in the record. It is adapted for office or store use, and by the use of familiar abbreviations, sufficiently large for the convenient and concise record of prices.

Size, 4 x 7 in.; grain seal leather.

FOUR EDITIONS:

B, 200 pages	-	-	-	-	-	\$1.00
B F, 200 pages with flap,	-	-	-	-	-	1.25
B 2, 400 pages,	-	-	-	-	-	1.50
B F 2, 400 pages with flap,	-	-	-	-	-	1.75



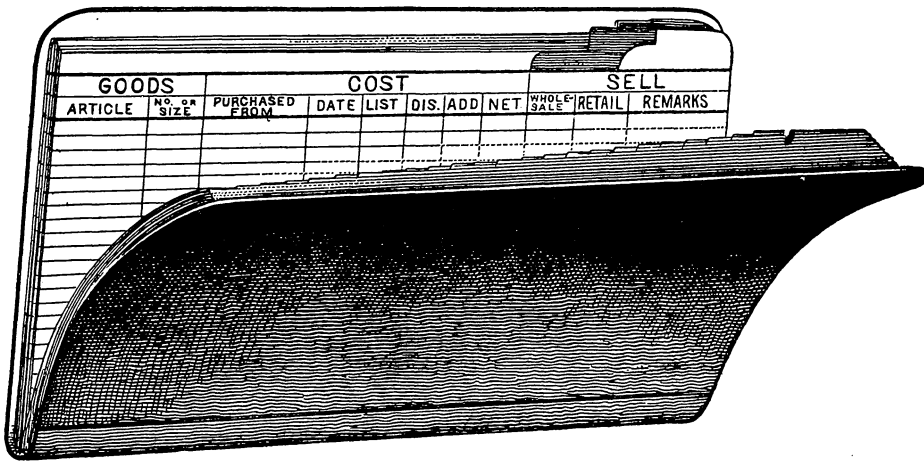
Hardware Price Book B.

The headings in Book C run across the top, in a line parallel with the hinge. In this way a very complete record can be kept on a single page. The details of weight and freight contained in Book A are omitted, and a single column headed "Add" given for the insertion of freight or other expenses which it is desirable to include in the cost. Under the selling prices space is left for the wholesale price, the retail price, and also for any remarks in regard to cost of the goods, desirability of pushing them, or other matters.

Size, 4½ x 7½ in.; grain seal leather.

FOUR EDITIONS.

C, 200 pages,	-	-	\$1.00
C F, 200 pages with flap,	-	-	1.25
C 2, 400 pages,	-	-	1.50
C F 2, 400 pages with flap,	-	-	1.75



Hardware Price Book C.

Price Book D will recommend itself particularly for desk and store use, and for salesmen on the road.

The name of the article, its number or size and the selling price are the first to meet the eye on the left-hand page, as embodying information desired when the selling price is required. The other headings follow in convenient order, by which a detailed memorandum regarding the goods may be kept, the whole being seen at a glance. A number of pages at the back of the book are arranged for memoranda, which will be found a great convenience. This arrangement is adapted to the requirements of the trade in this direction.

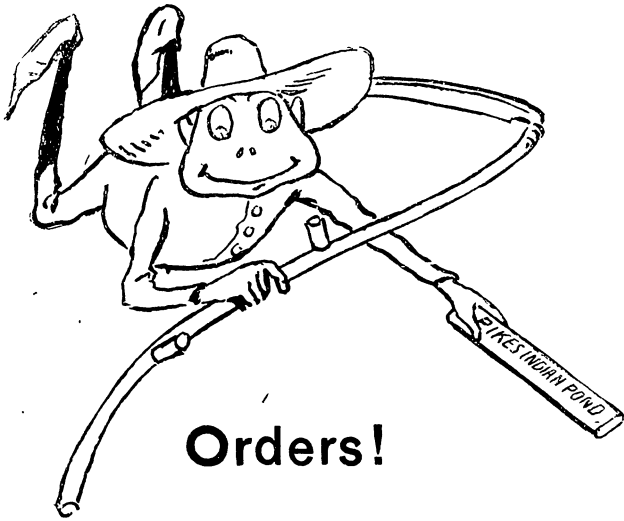
Hardware Price Book D.

Size 5¼ x 8 in.; grain seal leather.

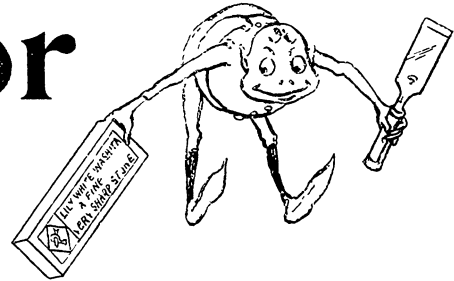
FOUR EDITIONS.	D, 200 pages,	-	-	-	\$2.00	D 2, 400 pages,	-	-	-	\$3.00
	D F, 200 pages, with flap,	-	-	-	2.50	D F 2, 400 pages, with flap,	-	-	-	3.50

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Orders!

Orders, Sir, if you Please.

“No Foundation in Fact!”

To the report that we have more orders than we can fill.

The demand for something that will sharpen these dull times and remove the dull edge of inactivity and discontent is, to be sure, tremendous, universal! Nevertheless our stock of sharpening material is still large and we are filling orders promptly.

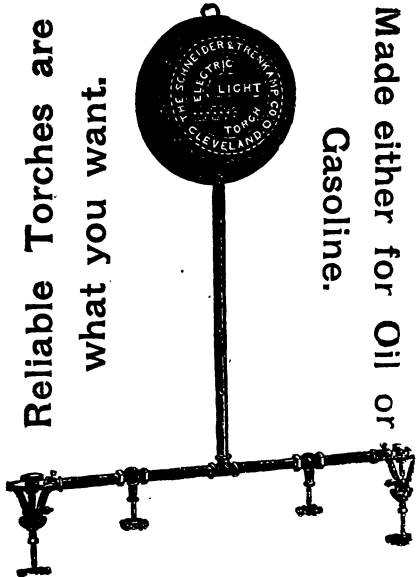
Pike's Indian Pond, Lamoille, Green Mountain, Black Diamond, Premium Quinnebog and Willoughby Lake Scythe Stones are the brands that increase your sales.

Pike's Lily White Washita

Will increase your customers and your profits.

THE PIKE MFG. CO., Pike Station, N. H., U. S. A

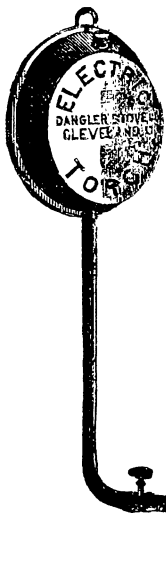
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Made either for Oil or
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These Torches are particularly adapted for use in Factories, Foundries, Machine Shops, Rolling Mills, Blacksmith Shops, Warehouses, &c. They make a strong white light, are free from smoke and are not affected by wind or rain. They are convenient and portable. These Torches can be run at an expense of about one-half cent to one cent per hour, burning a bright, steady light which is ten times greater than the light of an ordinary gas burner.

Write us for prices. A liberal discount given to the trade. Manufactured by
THE SCHNEIDER & TRENKAMP CO.
Nos. 478 to 497 Case Ave., Cleveland, Ohio.



Dangler Electric Torches

FOR
GASOLINE
OR
OIL.

14 JETS OF LIGHT

3 to 6
INCHES
LONG.

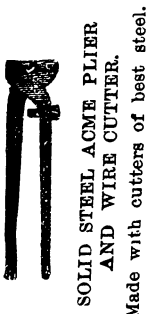
FOR lighting manufacturing establishments, such as Rolling Mills, Foundries, Machine Shops, Engine Rooms, &c., &c., with a convenient, portable, brilliant, steady light, and by cheaper means than by Coal Gas

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ACME CUTTING TOOLS.

Made in all Sizes.



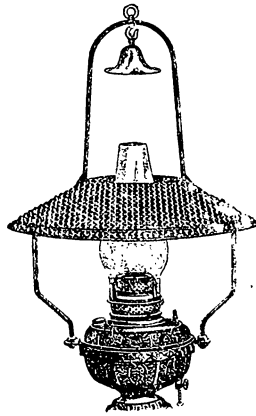
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ACME CUTTING NIPPER.
Jaws of choicest Tool Steel, dovetailed into the head, making it as strong as solid steel.



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New York Office, 18 Cliff Street.

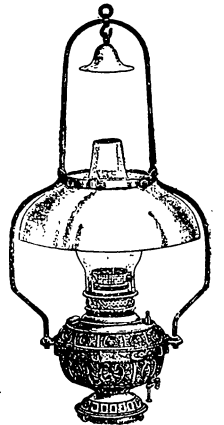
THE LAMP TO LIGHT YOUR STORE. MAMMOTH CENTRAL DRAFT BANNER.



With 20-inch Tin Shade.

No. 858. Size 3.

Enlarged Oil Pot
No Smoke.
No Smell.
Cheaper and Better than Gas.
300 Candle Power.
Holds One Gallon Oil.
Burns Brightly about 10 hours.



With 14-inch Dome Shade.

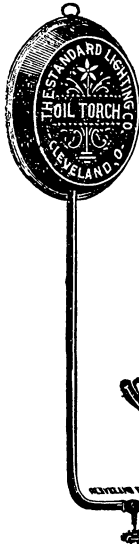
The Banner is the only Fount having Extra Feeder Wick which supplies oil to the Burning Wick. Harp has our Patent Extension Band, allowing Fount to pass down and through instead of lifting over as in the old style harp. Flame is regulated by our Improved Ratchet Movement. This Movement gives an exactness and nicety in adjusting that is not possible in any other wick raising device.

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THE PLUME & ATWOOD MFG. CO.,
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LIGHT YOUR DARK SHOPS CHEAPLY.

Give your men plenty of Light and they will do
double work.

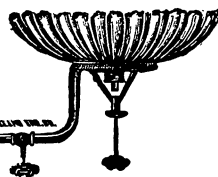


The Wall Torch has been used for several years as a means of illumination in Mills, Foundries, Machine and Car Shops, Tunnels, Street Stands, Band Stands, Smith Shops, etc.

While there are many cheap, inferior torches made which injure the sale of a good article, and condemn the Torch in general, our "Incandescent" Wall Torches are recognized as the best, and are now in use in the largest manufacturing establishments in the country giving PERFECT SATISFACTION, as is evidenced by the DUPLICATE ORDERS we receive from year to year.

They burn 150° Coal Oil, or 74° Naphtha, requiring a different burner for each.

In ordering be careful to state which is desired.



Price, for Single Torch, complete, \$2 each.

SPECIAL PRICE QUOTED FOR QUANTITIES.

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THE MALIN & CO.

34 and 36 Long St., Cleveland, Ohio

Manufacturers and Dealers in Steel, Copper and Brass
Wire of all kinds.

Patent Spooled Wire

For Retail Hardware Trade and Wire Specialties.

Dealers who handle it do away with the Broken Bundle Business and sell small quantities by the spool only. It is a convenience for both dealer and consumer. It is Shellac Coated and Cannot Rust; is wound like spool cotton on 1 oz., ¼ lb., ½ lb., 1 lb. and 5 lb. Spools.

Special Wires Spooled for manufacturing purposes. Send for illustrated Catalogue and prices. Sold by all Hardware Dealers.

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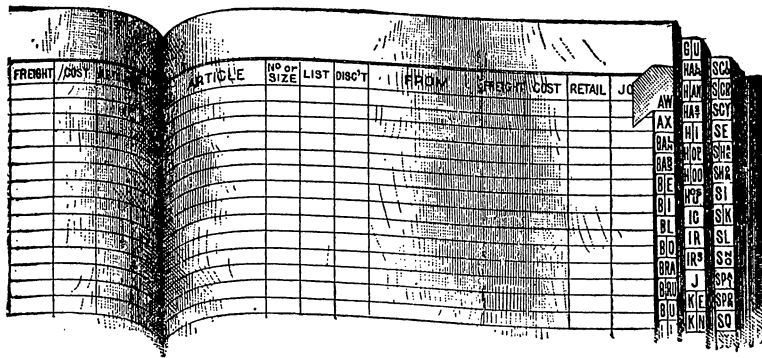
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Retail Stock contains 147 Spools

The Iron Age Hardware Price Book E.

SECOND EDITION, REVISED AND ENLARGED, WITH MULTIPLE INDEX (Patent Pending).



AD GU SC₀
 AN HA_M SCR
 AU HAN SCY
 AW HA_T SE
 AX HI SH_E
 BA_N HO_L SH_R
 BA_S HOO SI
 BE HO_S SK

1 ac-Simile of Indexing.

SIZE.—The book is 7 x 10 inches (much larger than Price Books A, B, C, or D), 350 pages.

PAPER.—The paper is the celebrated Crane's heavy ledger paper, tough and strong, permitting frequent changes and erasures.

BINDING.—The binding is of the very best quality—flexible seal grained leather.

INDEX.—By means of the arrangement shown in the cut the index applies to every page (except Supplement) and permits reference to any article at a single motion. This greatly facilitates the use of the book, avoiding the troublesome turning from page to page which is necessary in connection with other Price Books. It has been prepared with great care, and it is believed that it provides a place for every article in the Hardware line.

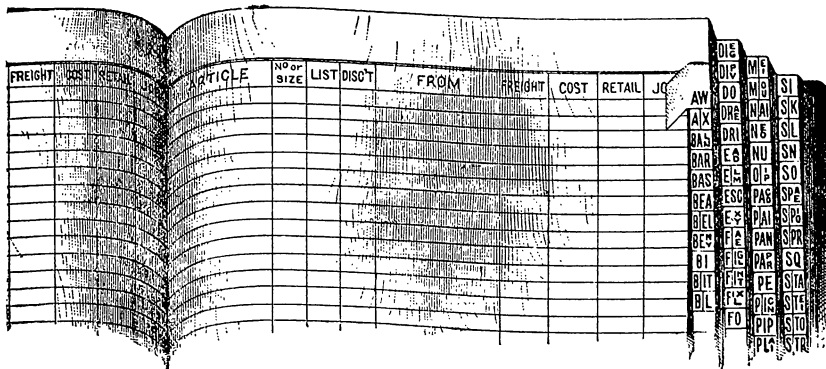
ARRANGEMENT.—The book is arranged to keep a complete record of prices on a single page, the width giving sufficient room.

SUPPLEMENT.—A 40-page Supplement is provided to give room for supplemental quotations, memoranda, tables, &c.

THIS BOOK IS ISSUED IN ONLY ONE EDITION, PRICE, \$5.00.

The Iron Age Hardware Price Book F.

WITH MULTIPLE INDEX (Patent Pending).



AD DI_E ME SI
 AN DI_V MO SK
 AU DO NAI SL
 AW DR_E N_O SN
 AX DRI NU SO
 BA_N E_A O_P SP_E
 BAR E_M PA_S SP_I
 BAS ESC PAI SPR

Fac-Simile of Indexing.

SIZE.—The book is 8 1/4 x 11 inches (much larger than Price Books A, B, C, D or E), 556 pages.

PAPER.—The paper is the celebrated Crane's heavy ledger paper, tough and strong, permitting frequent changes and erasures.

BINDING.—The binding is of the very best quality—flexible seal grained leather.

INDEX.—By means of the arrangement shown in the cut the four rows of index applies to every page (except Supplement) and permits reference to any article at a single motion. This greatly facilitates the use of the book, avoiding the troublesome turning from page to page which is necessary in connection with other Price Books. It has been prepared with great care, and it is believed that it provides a place for every article in the Hardware line, and gives ample space for recording prices.

Sufficient space has been provided for large lines of goods such as Axes, Bits, Springs, etc., by allowing four pages to such indices, instead of two pages, as for lines of goods requiring less space. This is accomplished, as in AX for example, in Book F by having a short tab with the letter A on the tab on the first leaf, and AX on the tab on the second leaf. The A on the first leaf is directly over the A on the lower leaf, so that the index reads AX whether looking at both leaves together, or at the lower one only.

The four rows of index tabs are printed in gold letters on black Russia leather. The tabs are securely fastened on both sides of each page, making a handsome and durable index.

ARRANGEMENT.—The book is arranged to keep a complete record of prices on a single page, the width giving sufficient room.

SUPPLEMENT.—An 80-page Supplement is provided to give room for supplemental quotations, memoranda, tables, &c.

THIS BOOK IS ISSUED IN ONLY ONE EDITION, PRICE, \$7.50.

Advantages of Multiple Index Price Book.

A SPECIAL feature of the books is the arrangement of the index characters, which, instead of being alphabetical, are arranged with special reference to the classification of Hardware goods, each index character giving the first two or three letters of the names of Hardware articles as shown above. The ease and convenience with which the books can be used is indicated in the following examples, taken from Book F:

For Augers, turn to AU	For Chisels, turn to CH _U	For Iron, turn to IRO
" Parers, Apple " PA _R	" Cutlery, " CUT	" Irons, " IR'S
" Saws, " SAW	" Cartridges, " CAR	" Shovels, " SH _O
" Pumps, PUM _N	" Rules, " RU _L	" Grindstones, " GRI
" Bits, " BIT	" Locks, " LO	" Stones, " STO

Special care has been taken to make the classification as indicated in the index correct and comprehensive, making provision for all Hardware articles and giving sufficient space for the keeping and recording of prices. It is thought that every strictly Hardware article has its first two or three letters given, thus permitting immediate reference to it by a single motion.

It is, however, obvious if any articles are not directly designated by the index characters, that the index, being alphabetical in its arrangement, indicates the place where quotations on such articles should be recorded. The supplement, however, may be found useful for quotations on any outside goods which the Hardwareman may desire to keep prices on, while at the same time it may be used if necessary for any overflow of matter from the preceding pages, or to contain list prices or other matter relating to goods.

Hardware Classification.—A pamphlet containing a classification of the leading Hardware articles is furnished with the price books.

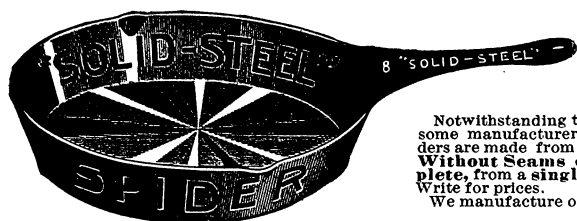
Standard Lists.—In connection with these price books a set of *The Iron Age* STANDARD HARDWARE LISTS can be used with great advantage. Price 25 cents.

These price books, which have been prepared by R. R. Williams, Hardware Editor of *The Iron Age*, are presented to the attention of Hardware men in the confidence that they will be found a most valuable aid in keeping track of prices.

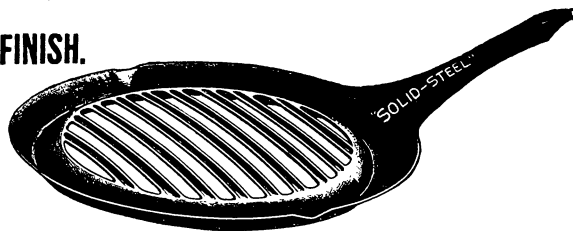
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DAVID WILLIAMS, Publisher, - 96-102 Reade St., New York.

"SOLID-STEEL" SEAMLESS HOLLOW WARE.



BRILLIANT FINISH.



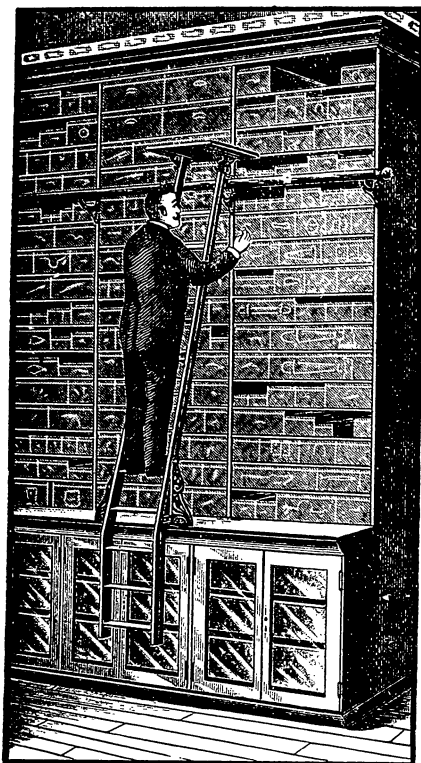
Notwithstanding the claims made by some manufacturers' agents our spiders are made from Wrought Steel, Without Seams or Rivets, Complete, from a single piece of metal. Write for prices. We manufacture our own goods.

No Seams, no Rivets in "Solid-Steel" Ware.

Made without Seams or Rivets.

The Cleveland Stamping & Tool Co., Cleveland, O.

We do Light and Heavy Stamping and Blanking. Also build Dies and Stamping Machinery.



THE BICYCLE STEP LADDER.

Highest Award, Columbian Exposition.
The Newest, Neatest, Simplest, Easiest Operated and Safest Store Ladder made.
Ladders are not Suspended, but Supported from below on wheels. Move easier with operator on than others when empty. Highly finished, and very handsome. Made in different grades and prices to suit. Send for illustrated catalogue and prices. See this space next week for other styles.

The Bicycle Step Ladder Co., 50 State Street, Chicago, Ills.

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PURE ALUMINUM COOKING UTENSILS

Meeting with such universal appreciation, we think it to our interest to appoint ONE responsible firm of Hardware Merchants in EACH town and city as our sole agents.

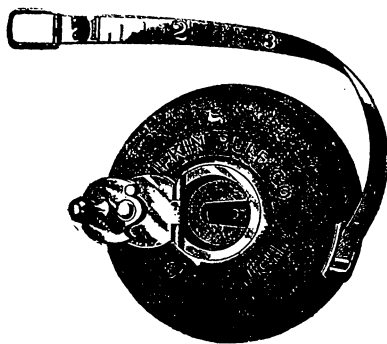
ILLINOIS PURE ALUMINUM CO., LEMONT, ILLINOIS.

Manufacturers of Sheets, Medals, Utensils.

Phillips Screens

FOR DOORS AND WINDOWS, ARE WELL MADE, FROM GOOD MATERIALS BY

A. J. Phillips & Co., Fenton, Mich.

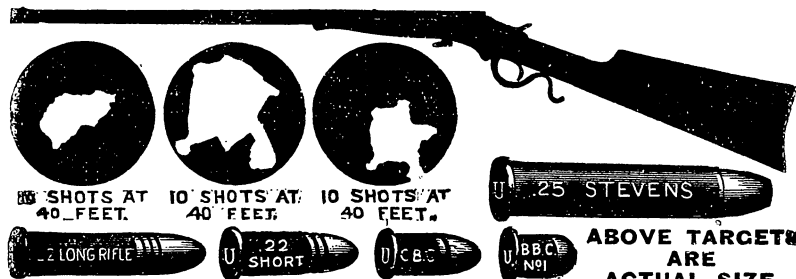


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Entirely new. Handle or crank when closed is perfectly flush with leather case. Opens by pressing button on opposite side and folds out double, giving increased leverage. Best and most convenient steel tape on the market. Fully guaranteed. Will send samples on approval. We carry a complete stock of our goods at our New York Office, 20 Murray St.

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A Triumph in Small Bore Rifles. STEVENS' "FAVORITE" RIFLE.



10 SHOTS AT 40 FEET. 10 SHOTS AT 40 FEET. 10 SHOTS AT 40 FEET.

2 LONG RIFLE 22 SHORT 22 CB 22 BB

25 STEVENS

ABOVE TARGETS ARE ACTUAL SIZE.

Made for the 22 or 25 Rim Fire Cartridge.

WEIGHT, 4 1/2 POUNDS.

22-INCH BARREL.
LEVER ACTION LIKE SHARPS.
TAKEN APART IN TEN SECONDS.
IT IS SIMPLY IMPOSSIBLE TO MAKE MORE ACCURATE SHOOTING BARRELS THAN ARE ON THIS RIFLE.

No. 17. Plain Open Sights.....\$12.50
No. 18. Vernier, Open Back, and Beach Front Sights..... 17.00
No. 19. Lyman Peep, Open Back, and Lyman Front Sights, 17.00

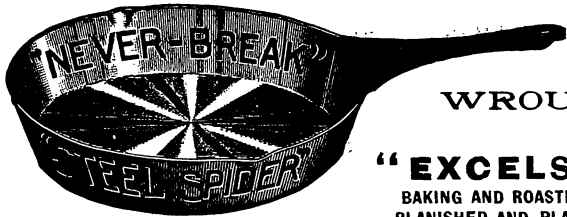
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OTHER SPECIALTIES.

"IDEAL"

BRASS, BRONZE, NICKEL UM-
BRELLA STANDS, CUSPIDORS,
ETC., ETC., ETC.

THE BRONSON SUPPLY CO.,
CLEVELAND AND NEW YORK.



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Globe Street Lamp.

Light your Streets and Driveways.

The S. G. & L. CO.

Tubular Globe Street Lamp

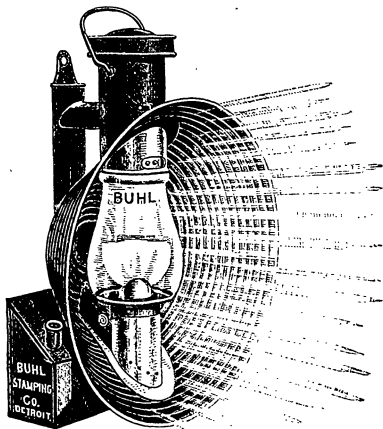
IS THE Best Street Lamp Manufactured.
Equal to the best Gas Light.
Will not Blow Out in the Strongest Wind.
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Automatic Extinguisher.
Outside Wick Regulator.
Will Burn Four Hours for One Cent.

MANUFACTURED BY

STEAM GAUGE AND LANTERN CO.,

SYRACUSE, N. Y.

Western Branch, 25 Lake St., Chicago, Ill.



Buhl Tubular Headlight.

IMPROVED FOR 1893-94.

The most brilliant light at least
expense for Halls, Factories,
Barns, Boat Houses, Traction En-
gines, etc.

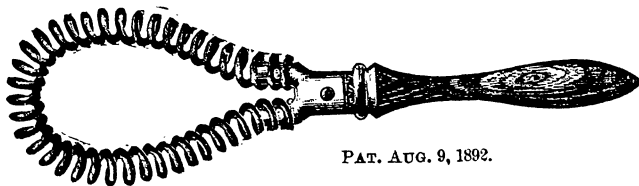
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MANUFACTURERS OF

TUBULAR LANTERNS. STEEL MILK
CAN STOCK and BIRD CAGES.

THE BOSS DUST BEATER.



PAT. AUG. 9, 1892.

NEAT, DURABLE, AND DOES THE BUSINESS.

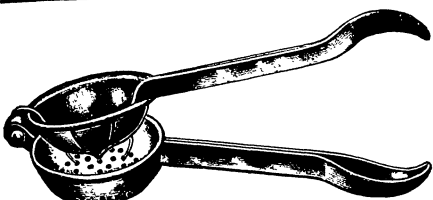
For removing dust and filth from Clothing, Upholstered Furniture, Rugs and Carpets it is just the thing. Will raise the nap and so improve the appearance. Will not, like other Dust Beaters, leave marks, nor tear the fabric. The coil is of steel wire secured in a malleable iron socket and attached to an enameled wooden handle. Just what everybody wants.

Retail Price, 25 Cents. Sent by Mail, 35 Cents.

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Manufacturers,

TROY, N. Y.



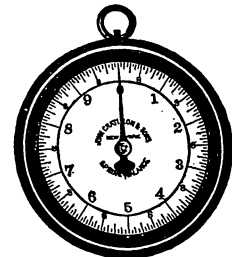
Do you make Lemonade?

If so you want our Squeezer. Positively
the best. Suitable for any size Lemon.
Write for catalogue and prices.

BERGER BROS., 237 Arch St., Philadelphia, Pa.

John Chatillon & Sons,

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1835.

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DO YOU USE

LEATHER PARTS,

Straps, Washers, or Special Shapes in
Leather, hand or machine sewed

Leather Work of any description,

Skate Straps or Mountings

Write for Estimates, mentioning this paper,

J. FRANK GREENE,

278 Water and 14 Dover Sts., NEW YORK.

NEW
and the
BEST.

"THE HUSTLER"

Post Hole Digger.

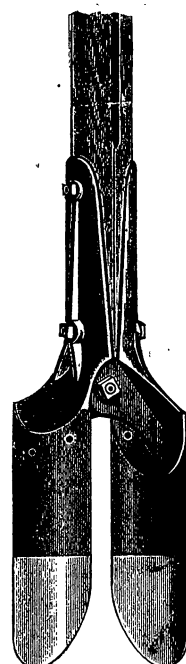
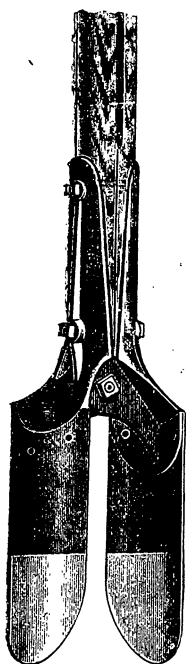
 **BUILT FOR BUSINESS.** 

This tool combines simplicity with correct form for easy and rapid digging. It is neat in design, finely finished, strong and durable.

The single round handle opens in halves to operate, being easily grasped and less tiresome than two separate handles; all other movements of split handles are liable to pinch the operator's hands.

This special style of bolting handles to shanks in round form enables them always to be kept tight in case of shrinkage. A shoulder is provided at the bottom to receive the full thrust, instead of on the bolts. This is not found in other makes, and prevents handles from splitting.

The best materials only are used. Fully guaranteed.



5 — Other Styles of Post Hole Diggers to — **5**
Suit all Soils.

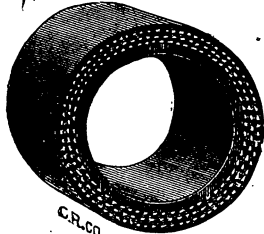
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JOHN H. GRAHAM & CO.,

**113 Chambers St.,
NEW YORK.**

NEW SEAMLESS TUBE



Who Has Not Had Bad Hose?

Who has not lost time, patience, money, by attempting settlement for such goods?

THE CAUSE in nine cases out of ten is the lapped seam.
THE REMEDY is in buying our

PATENT SEAMLESS TUBE HOSE,

made by machinery, the tube run like lead pipe, through a die. There is no lapped tube, no seam, no cracks, no defects; water cannot get through to rot the duck and cause the hose to burst.

Made in All Sizes and Kinds of Garden, Engine, Steam, Fire, Brewers', Cotton Hose, &c.

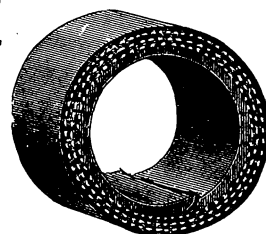
Order a Sample Bale of our Seamless-Tube Hose—Best in the World, costs no more than ordinary lapped-seam hose. The different colors, Red, White, Black, Green and Yellow, make a fine window or sidewalk attraction.

CLEVELAND RUBBER WORKS

of the Mechanical Rubber Co.,
CLEVELAND, O.

Makers of Mechanical Rubber Goods, Clothing, Druggists' Sundries, Specialties, Etc.

'OLD LAPPED TUBE'



We were awarded an order of 25,000 ft. for World's Fair of our celebrated
Seamless-Tube
COTTON RUBBER-LINED HOSE.

We Want Your Trade.
Send for 60-page Catalogue.
Write for Prices and Samples.

SALES OF
Over Two Million Feet
—OF—

GARDEN HOSE

alone during the past year, distributed throughout the United States, and not a single piece complained of, justifies us in guaranteeing that it will give absolute satisfaction.

— THE —

Columbian Rowlock,

With Interchangeable Sockets.

Number,	0	1	2	3	4
Between Horns,	1¾.	2.	2¼.	2½.	3 inch.

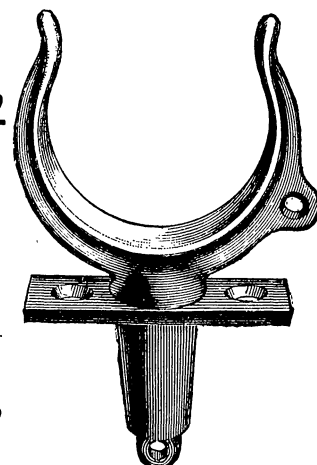
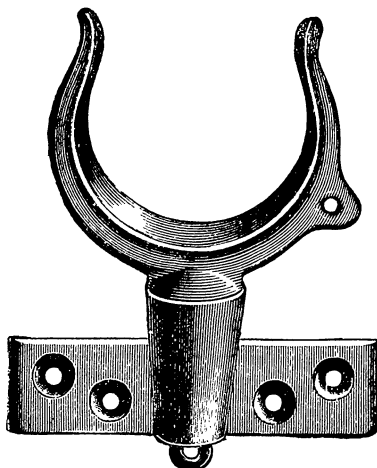
LIGHT, STRONG and GRACEFUL.

Galvanized Gray Iron and Malleable Iron.

Nos. 0, 1 and 2 are furnished with either Side Plate or Regular Sockets.
Nos. 3 and 4 are furnished with Regular Sockets only.

NEWHALL SHIP CHANDLERY CO.,

105 Chambers St., New York.



BUY THE BEST. THE Challenge Iceberg Refrigerators,

MANUFACTURED BY

The Challenge Corn Planter Co.,

Grand Haven, Mich., U. S. A.

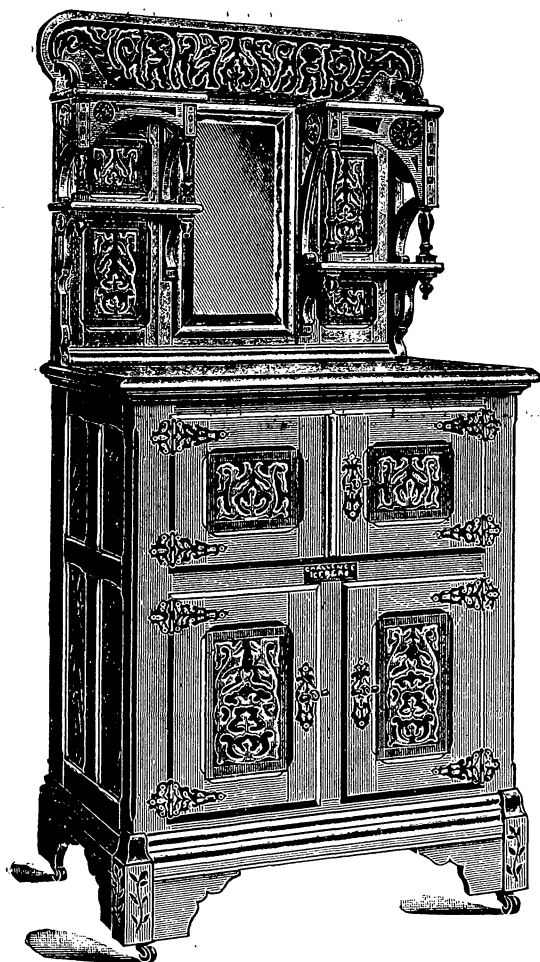
Write for our large Illustrated Catalogue for 1894.

All our goods are made of thoroughly kiln dried ash, finished in antique with shellac and coach varnish. Panels are beautifully hand carved. Trimmings are of solid bronze and are our own pattern. We use our own patent air tight locks, patent self-retaining malleable casters and floor plates, and patent drip cups. All refrigerators are filled with pure charcoal. The Challenge Iceberg Refrigerators are the best made for preserving all articles stored therein pure and sweet, as there is always a circulation of pure, dry, cold air. Refrigerators having water coolers are provided with bronze faucet and cup holder. All Sideboards have a fine beveled French plate mirror. We manufacture Refrigerators of all sizes from the ordinary Ice Chest to the largest sizes for grocers' and butchers' use, including the most elegant line of Dining Room Sideboard Refrigerators ever put on the market.

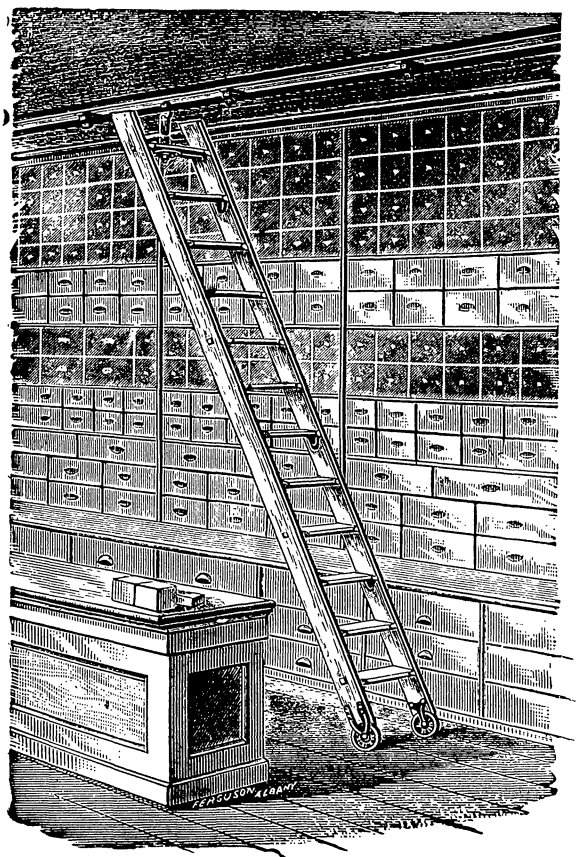
GENERAL AGENTS:

F. T. Witte Hardware Co., New York, N. Y.
D. W. Cushing, Boston, Mass.
F. M. Borden & Bro., Phila., Pa.
Simmons Hardware Co., St. Louis, Mo.
Buhl, Sons & Co., Detroit, Mich.
Kent & Stuchfield, Denver, Col.
Chicago Stamping Co., Chicago, Ill.

Lee-Clarke-Andresen Hardware Co., Omaha, Neb.
John Pritzlaff Hardware Co., Milwaukee, Wis.
A. Baldwin & Co., New Orleans, La.
Gurney Refrigerating Co., Oakland, Cal.
Wm. Miller Range & Furnace Co., Cincinnati, O.



THE "NOISELESS" STORE LADDER.



The latest and best. Perfectly noiseless. Neat in appearance.

Manufactured by

M. CROISSANT,

ALBANY, N. Y.

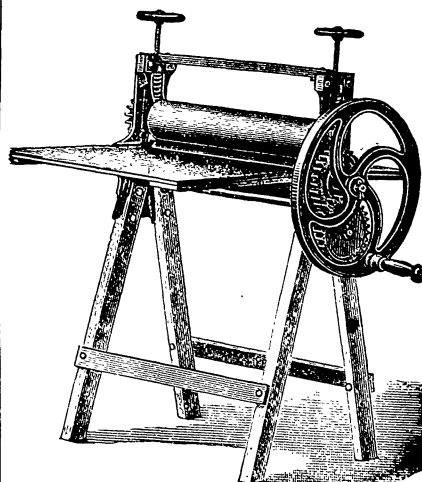
The Family Mangle.

WARRANTED TO DO

Better Work than Hand-Work.

SAVES all the fuel,
two-thirds the work.
Keeps the linen whiter.

We Guarantee Every Machine.



Send for descriptive circular to

S. C. Johnson, Racine, Wis.

Agents Wanted.

COMMON MOUSE TRAPS
BEST FOR USE!

Ripley Mfg. Co., Unionville, Conn.

Porcelain-Lined Lemon Squeezers, Steak Hammers, Boot Jacks, Magnetic Tack Hammers, Mallets, Bung-Starts, Hand Screws, Beacon Hill Pat. Mouse Traps, Sunny-Side 2 lb. Lap Board.

The Sun Manufacturing Co.

Successors to the Jno. M. Waddel Mfg. Co.,

ARE SOLE OWNERS AND MANUFACTURERS OF

**Waddel's Improved Coffee Mills,
Cathedral Gong Money Drawer and Surprise Rat Traps.**
Beware of Infringements.—We will protect our Patents.

"THE 'SUN' ONLY, SHINES FOR ALL."

A New Name, A New Reputation,

A New Line of Coffee Mills

That under the SUN Brand shine as leaders.

RAPID GRINDERS that will STAND THE WEAR.

STEEL ALLOY BUHRS,

A metal of recent discovery for this purpose used solely and only by the SUN. Warranted to outwear, outgrind and outsell any Coffee Mill ever put on the market.

We Challenge a Competing Test for Rapid Grinding and Wearing Surface.

Our New Line bears the Sun Trade Mark and is labeled Steel Alloy Buhrs.

Write for Our Catalogue and New Prices.

Order a Sample Mill.

THE SUN MANUFACTURING CO.,

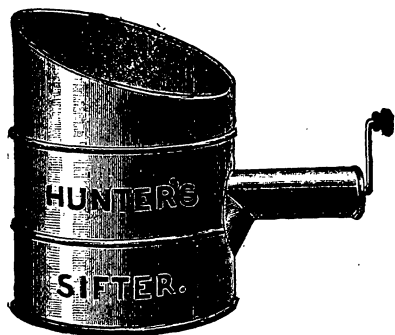
Greenfield, Ohio, U. S. A.,

MANUFACTURERS OF

Cash Registers, Money Drawers, Coffee Mills and Wooden Ware Specialties



Boasting Will Not Sell . . .



The best Flour Sifter that's made without it has the necessary merit claimed for it and features that excel all others. The Hunter, possessing the most merit and good features, hence is the most popular.

The FRED J. MEYERS MFG. CO.,

COVINGTON, KY.

F. J. MATTISON, Eastern Agent,
NEW YORK.

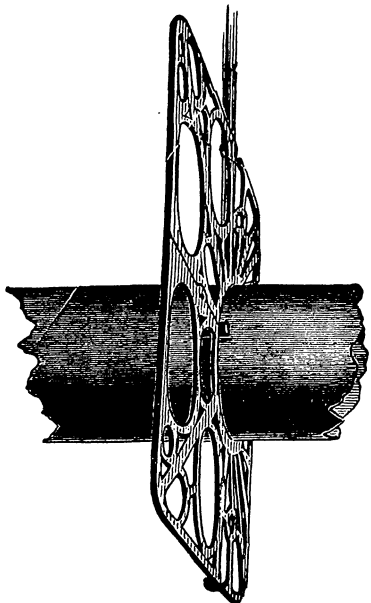
The Henry C. Hart Mfg. Co.

DETROIT, MICH.,

MANUFACTURERS OF

HARDWARE SPECIALTIES.

STANDARD STOVE PIPE SHELF.



SEND FOR CATALOGUE.

WHY USE WOODEN OR HEAVY STEEL BLOCKS

WHEN THE STEEL AND IRON

TACKLE BLOCKS

—MADE BY—

The Cleveland Block Co.

CLEVELAND, OHIO, U. S. A.,

ARE BETTER IN EVERY WAY.

No waste material. Every ounce of weight in the line of strength. No clumsy outside straps or bolts. As light as wooden blocks and vastly more durable. They wear, but never break. Sheaves interchangeable

General Agents: Topping Brothers, 92 Chambers Street, New York.
The H. Channon Co., 22 Market Street, Chicago.
New England Agents: Dodge, Haley & Co., 212 High Street, Boston.

THE CLARK MFG. CO.,

Blind Hinges, Gate Hinges, Door Butts,

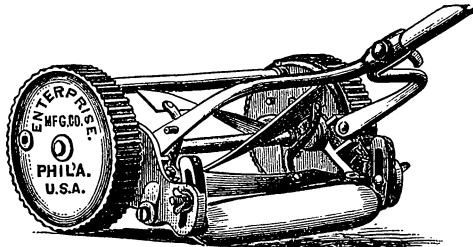
And other **HARDWARE SPECIALTIES**

BUFFALO, N. Y.

BOOKS. YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing **DAVID WILLIAMS**, Publisher and Bookseller, 96-102 Reade Street, New York.

THE ENTERPRISE M'FG CO. OF PA.,

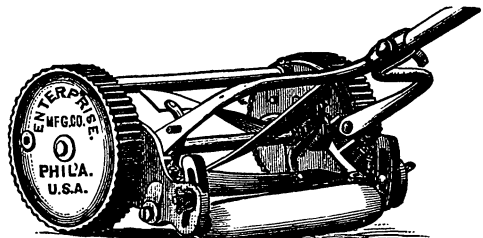
Thrd and Dauphin Sts.,
Philadelphia, U. S. A.



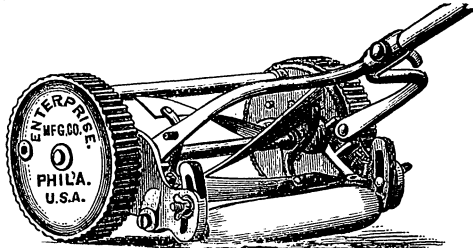
7, 9, 11, 13, 15 inches.

—O—
PAINTED
and

—O—
TINNED.

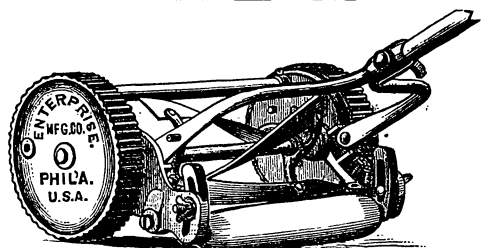


ENTERPRISE LAWN MOWERS!



EQUAL TO
the
BEST.

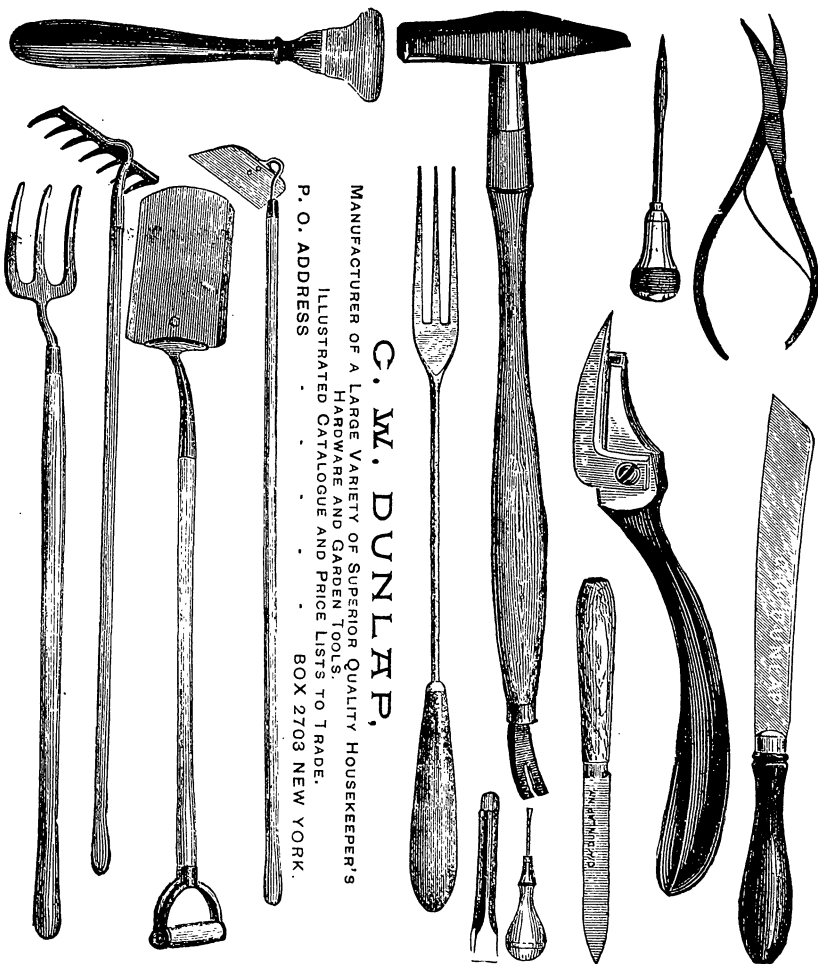
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Prices quoted
on Application.



FOR SALE BY THE HARDWARE TRADE.

Branch Office and Warehouse with J. C. McCarty & Co., 97 Chambers Street, New York City.

SEND FOR CATALOGUE, FREE.



C. W. DUNLAP,
MANUFACTURER OF A LARGE VARIETY OF SUPERIOR QUALITY HOUSEKEEPER'S
HARDWARE AND GARDEN TOOLS.
ILLUSTRATED CATALOGUE AND PRICE LISTS TO TRADE.
P. O. ADDRESS
BOX 2703 NEW YORK.

"Washing Done,"

Thoroughly well done, and done quickly as well, in the

..Columbia Washer..

This Machine illustrates in combination a simple and effective mechanism, all metallic parts of which are heavily galvanized, and a body of selected Virginia White Cedar, of all woods the one least affected by contact with water.

Seasoned White Cedar frequently lasts one hundred years, whereas the buyers of Washing Machines very seldom do, consequently the purchaser of a Columbia Washer secures in it an heirloom for the next generation.

We shall be pleased to send you full details of the Columbia Washer.

THE "LIFE"

of a PAIL or TUB is simply that of the hoops holding its staves together, and its constitution is hopelessly shattered simultaneously with any impairment of the aforesaid hoops.

We are now making solid nonbreakable hoops of heavy wire, viz., the

Electric-Welded Wire Hoop,

which is practically indestructible, and are applying such to our Best White Cedar Ware in a manner that renders it vastly superior to all other forms of construction. These Welded Hoops are imbedded, by a patented process, in grooves prepared for them on the outside of the vessel, and they grip the staves with a firmness that time and wear are alike unable to relax. As in the case of the Columbia Washer, the "Pale Messenger" will probably overtake most purchasers of these goods with a serviceable article still in use. Send for Circular.

Richmond Cedar Works,
RICHMOND, VA.

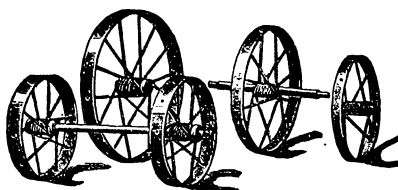
PHILLIPS SCREENS

Are Reliable.

Electric Toy Making, Dynamo Building and Electric-Motor Construction. By T. O'CONOR SLOAN, A.M., E.M., Ph.D. This work treats of the making at home of electrical toys, electrical apparatus, motors, dynamos, and instruments in general and is designed to bring within the reach of young and old the manufacture of genuine and useful electrical appliances. The work is specially designed for amateurs and young folks. Very fully illustrated..... \$1.00

For sale by David Williams, 96-102 Reade St. N. Y.

WHEELS. WHEELS. WHEELS.



The best there is made for Wheelbarrows and Trucks. Send for Circular and Prices.

Address

THE Arnold Metal Wheel Co.

Mention The Iron Age.

New London, Ohio.

American Stamping Co.,

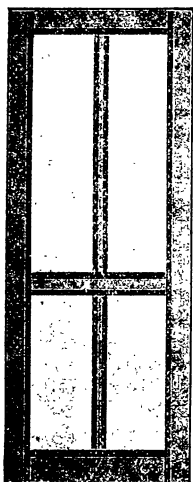
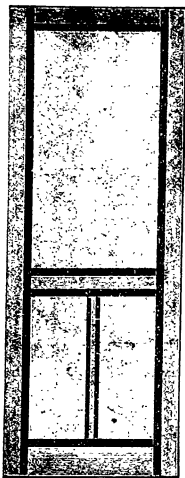
Manufacturers of

All Kinds of Tinware and Sheet
Metal Goods.

N. Y. Office and Salesroom, 104 & 106 John St.

Factory, 103 to 119 N 3d St., Brooklyn, E. D., N. Y.

Doweled vs. Mortised Screen Doors.



There being some honest discussion and some lying about this subject, we "take our pen in hand," the "pen being mightier than the sword," but not quite so mighty as the carving knife in the hands of a "blue" competitor.

The Dowel Door having originated with us, it is proper for us to say why we made it and why we continue to make it.

The first idea was, of course, economy; but that idea was soon knocked out of us. We found that boring 36 holes, buying 18 long corrugated hardwood dowels and practically driving every one of them twice wasn't so cheap as we had expected.

We found that it made a good stiff Door, however. That the Hardwood Dowels wouldn't rot off; that there were no tenons to shrink and loosen in a mortise; that we didn't have to cut away two thirds of the thickness of our stiles with a mortise; that we didn't have to leave the ends of the stiles sticking out at both ends to keep the top and bottom mortises from breaking out; neither were the ends of tenons projecting from the sides. In fact, we found that we could put on the market a door that was entirely finished, which, with the casing blocks, the customer could readily put up himself, without the aid of a carpenter and painter to finish it.

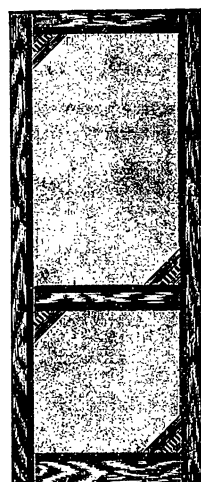
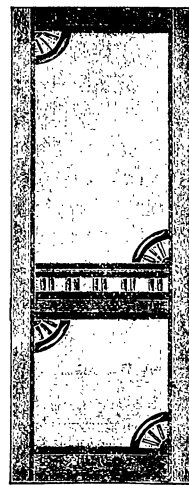
The mortise and tenon are all right in their place—viz.; when stiles are thick and rails are wide enough so that it is not necessary to mortise so close to the end of the stiles. But when the rails are only $2\frac{1}{2}$ inches wide, their bearing on the stile is so small that the door must necessarily be weak.

To test the matter of strength, cut off the projecting ends of a mortise and tenon door. Drop it "good and solid" on one corner, or "ride it" as the young ones sometimes do, and see what will happen. Do the same with a Phillips Door and you will send us the order, every time.

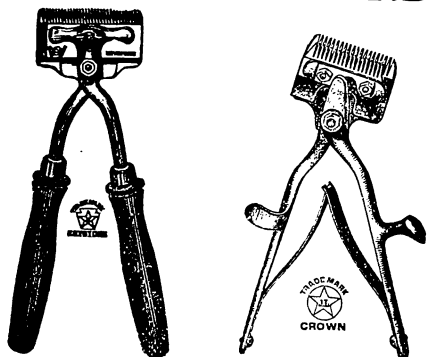
We guarantee our $\frac{7}{8}$ inch 4-inch stile door to be stiffer and stronger than it is possible to make a mortise and tenon door $1\frac{1}{8}$ inches thick with 3-inch stiles and rails

Send for our illustrated catalogue of Screen Doors, Windows and Frames.

A. J. PHILLIPS & CO., - Fenton, Mich.



IF YOU ARE INTERESTED IN CLIPPERS



For HORSEMEN OR BARBERS

Send Postal Card for our new Illustrated Catalogue.

JESSE LEE & SON,
37 SO. FOURTH ST., PHILADELPHIA.

Phillips Screens

FOR DOORS AND WINDOWS, ARE WELL MADE, FROM GOOD MATERIALS BY

A. J. Phillips & Co., Fenton, Mich.



DAIRY PAIL



DAIRY SPITTOON



CHAMBER PAIL



MILK PAN



BOWL PITCHER



SLOP PAIL



WASH BASIN.



COMMODE PAIL



CUSPIDOR



KEELER



SLOP JAR



WATER PAIL

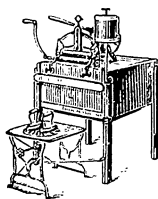


SPITTOON



WASTE BASKET

WATERPROOFED through SOLID. Light, CLEANLY, Handsome, DURABLE. Cheap as a GOOD ARTICLE can be made. ORNAMENTAL as well as USEFUL. Sold DIRECT TO THE TRADE. In this ARTISTIC age no dealer can afford to be without DECORATED FLAX FIBER WARE, bearing above trademark and made only by above Company.



WASHING DAY.

The saddest of all the year,
It brings no rest, it brings no cheer.

But the "Columbian" (Self-Heating) Washer and Stove Combined makes "Washing Day" as good as the others of the week. Does away with all lifting, and being around a hot stove. Washes and boils the clothes at the same time. A wonderful seller.

SEND FOR A SAMPLE.

BENBOW MFG. CO., - St. Louis, Mo.

CLOTHES WRINGERS. COLBY WRINCER CO.,

MONTPELIER, VT.

HAVE YOU Our Price-List?

Stone
Ware
Lined

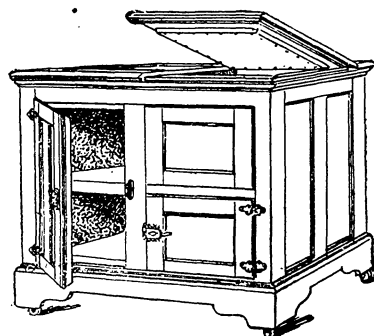
Refrigerators

SEAMLESS vitrified and glazed earthenware Provision Compartments. Practically indestructible; won't sweat, because of Perfect Dry Air Circulation. Liberally filled with the best Mineral Wool, and first-class in every particular Perfect cleanliness. No foul odors. Indurated Fiber Ice Racks that will not leak.

Quality Same, But Prices Lower.

WRITE FOR CATALOGUE AND DISCOUNTS.

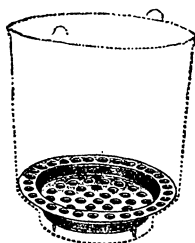
Monroe Refrigerator Co., = = = Lockland, Ohio.



SAFETY KETTLE BOTTOM.

Made from STEEL.

Prevents meats and vegetables from burning while cooking. Can be used for various purposes, either as Steamer, Broiler, Toaster, etc.



Cannot be Broken.

Prevents meats and vegetables from burning while cooking. Can be used for various purposes, either as Steamer, Broiler, Toaster, etc.

PATENT APPLIED FOR.

FOR PARTICULARS ADDRESS,

DIAMOND HARDWARE CO., 620 ATLANTIC AVE., BOSTON, MASS.

No. 4 ALL RATTAN BROOM.

Made for Switch, Snow, Yard, and all purposes to which an All Rattan Broom is especially adapted. It has been thoroughly tested, and our patent fastening is conceded to be the best, most convenient, and holds the rattan more firmly and in better shape than any other ever introduced. A trial will insure its continued use. We make a specialty of

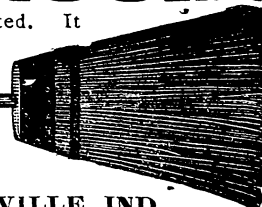
BROOMS and BRUSHES

FOR

RAILROADS, SHOPS, WAREHOUSES, STREET, STABLE, BLOOM, CHILL, CASTING AND MOULDING PURPOSES. Write

JOSEPH LAY & CO.,

RIDGEVILLE, IND.



GOLDEN CROWN WARE.

EXCLUSIVE SALE IN EACH TOWN GIVEN.

Allowance towards Advertising

Be Quick if you want Control of your City.

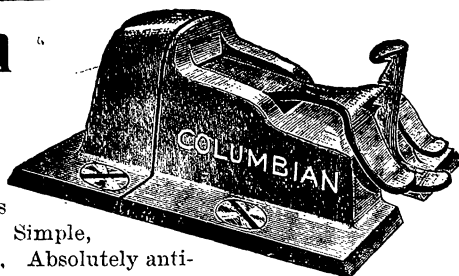
Particulars on Application.

THE STUART & PETERSON CO.,
Burlington, N. J., U. S. A.

Columbian

Sash

Locks three ways with one motion. Simple, strong and durable. Absolutely anti-rattle and burglar proof. Sample by mail, 35c.

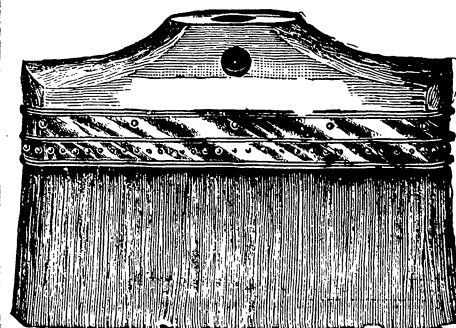


Lock.

COLUMBIAN SASH & DOOR LOCK CO.,
WAUSEON OHIO.

BRUSHES

FOR THE



Hardware Trade,

Whitewash, Horse, Paint, Window, Shoe,

And Every Variety of Brushes and

Wire Goods.

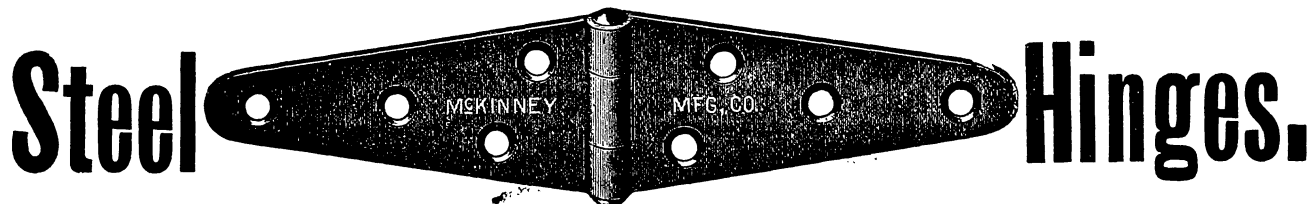
Close prices and prompt shipments. Get samples and catalogue for the asking.

Cincinnati Mfg. Co., Cincinnati, O.

WE CLAIM

That one pair of our Celebrated Steel Hinges will outwear two pair of the Flimsy Invention now being forced upon the attention of the trade.

McKINNEY MFG. CO., ALLEGHENY, PA.



SEND FOR LIST.

"NONE BETTER."

BARN, MILL AND FIRE DOOR HANGERS HIGHEST AWARD

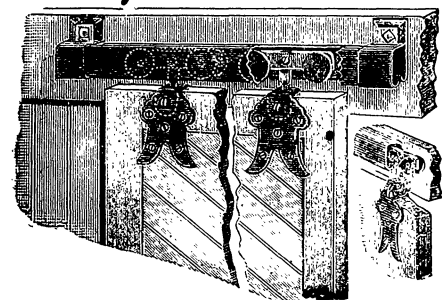
at WORLD'S FAIR, 1893,

— ON —

Parlor, Barn and Fire Door
Hangers.

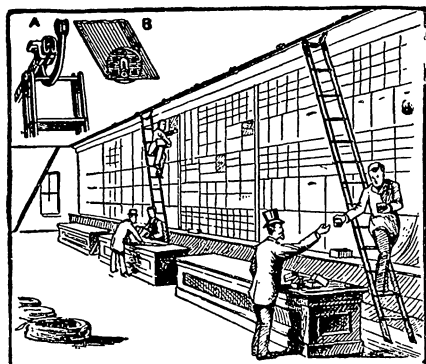
SEND FOR CATALOGUE.

COBURN TROLLEY TRACK MFG. CO.
HOLYOKE, MASS.



Barn Door with Lateral Adjustable Hanger. Very simple and cheap to apply.

We make four styles of FOLLING LADDERS to reach shelving of any height.



P. & F. CORBIN,

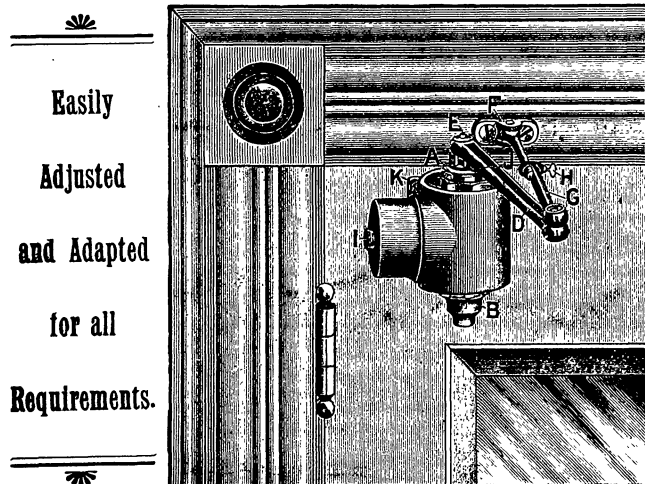
New Britain, Conn.

New York.

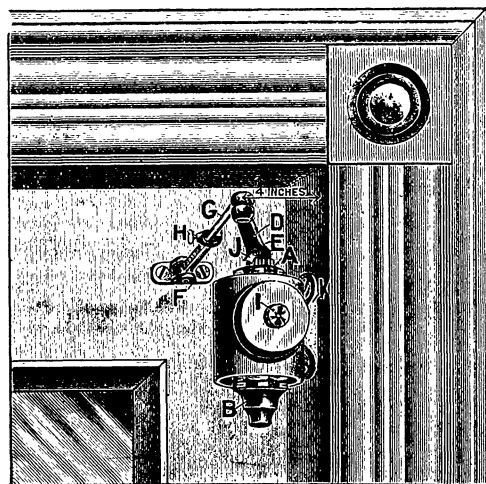
Philadelphia.

Chicago.

—) MANUFACTURERS OF (—



Easily
Adjusted
and Adapted
for all
Requirements.



Looks Well,
Acts Well,
Wears Well.

LIQUID DOOR CHECKS AND SPRINGS,

Fine Builders' Hardware. Wood AND Machine Screws.

Catalogues and Prices Furnished on Application.



SEASONED.

MRS. BRADY.—Oi don't know phat's th' matther wid it. Th' mon as sold it tould me it was made ov seasoned lumber.

BRADY (*in disgust*).—Seasoned, is it? Well, the lumber must hov been seasoned in th' Fall, thin, fer th' leaves are all droppin' ahf.—From *Puck*.

If the makers of the table had used

Stanley's Steel Table Hinges

the perplexities of the Brady family might have been averted.

The Stanley Works, NEW BRITAIN, CONN.
79 CHAMBERS ST., N. Y.

MAKERS OF

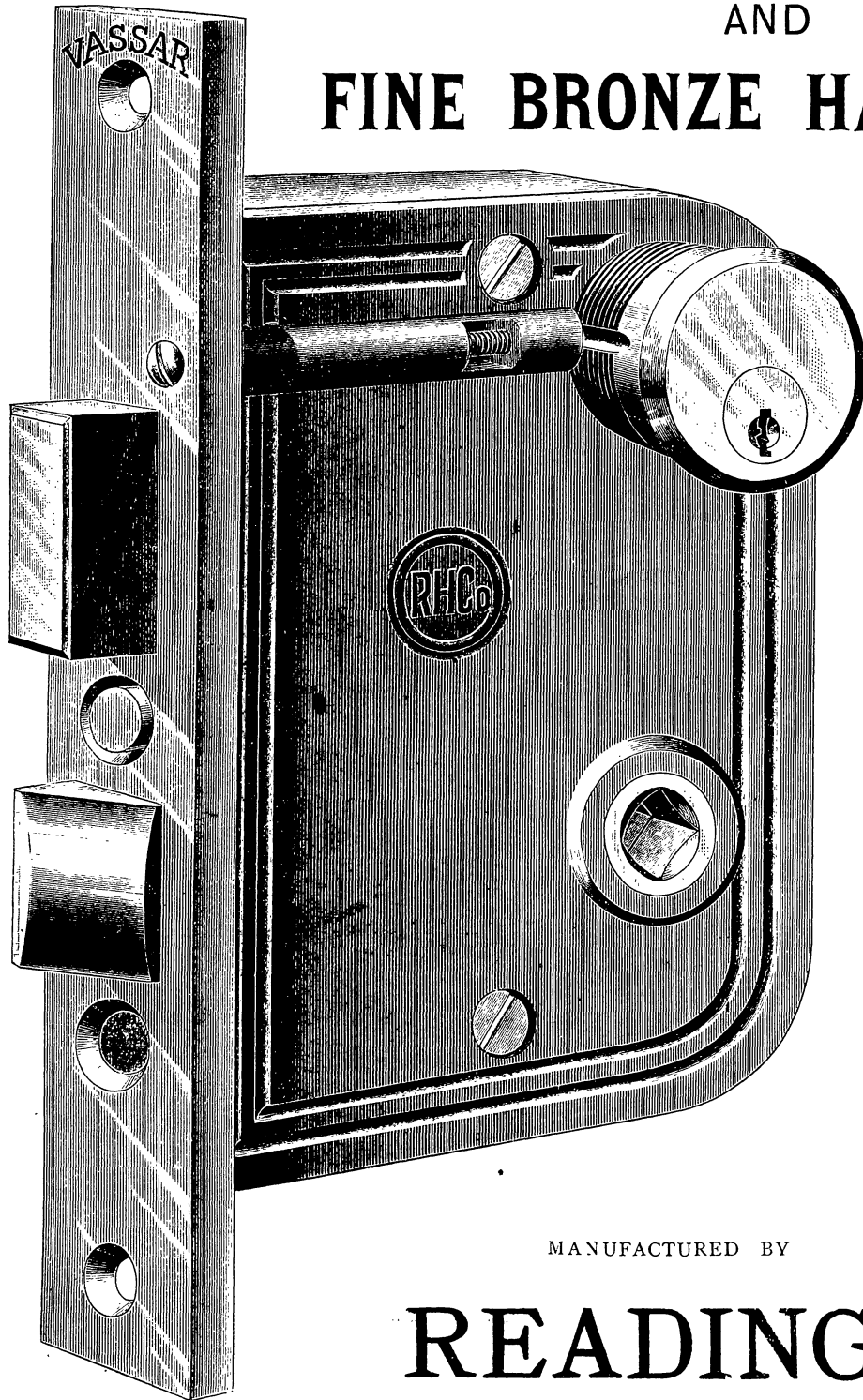
Wrought Steel Butts, Hinges, Blind Trimmings, Etc.

“VASSAR”

CYLINDER LOCKS

AND

FINE BRONZE HARDWARE.



—
PLAIN
PATTERNS

—AND—

ORNAMENTAL
DESIGNS.

—
“DUPLEX”
WROUGHT
BUTTS.
—

MANUFACTURED BY

READING

HARDWARE COMPANY

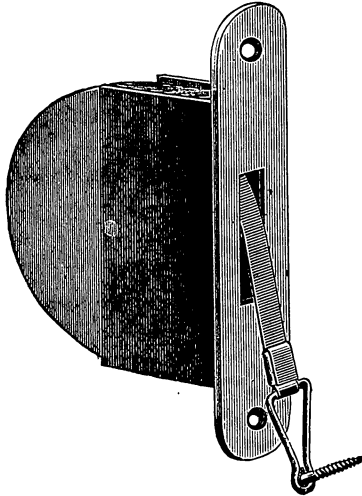
READING, PA.

NEW YORK,
81 Reade Street.

PHILADELPHIA,
514 Commerce Street.

CHICAGO,
73 Wabash Avenue.

A · Good · Article · Creates · Confidence.

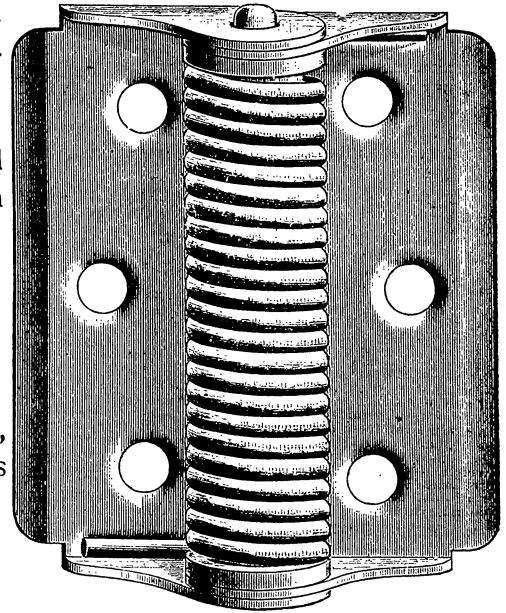


SIDE BALANCE.

Phenomenal success follows our business because the
Hardware Dealers, Architects and Contractors
are demanding our

PULLMAN STEEL FRAME SASH BALANCES

on account of their perfect construction and ease of application.
Can be applied to old as well as
new work. Require no pockets
or boxes. Cheaper than
weights and cord and last much
longer, the suspending band
being **ALUMINUM** makes them
indestructible.



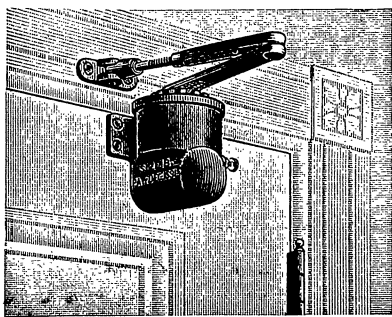
WROUGHT STEEL SPRING HINGES FOR SCREEN DOORS. BOTH REGULAR and HOLD-BACK.

We are the only make's using a loose pin in the joints,
which prevents binding or sticking and every hinge works
free.

WRITE FOR PRICES.

Pullman Sash Balance Co.,
ROCHESTER, N. Y.

N. Y. Office: J. H. Robley, 142 Chambers St.
Chicago Office: C. A. Woodruff, 235 Lake St.



Bardsley's Liquid Door Check and Spring

Perfect in action, durable, neat in appearance, low
in price and fully warranted. Responsible Agents
wanted in the principal cities.

J. BARDSLEY, 149 & 151 Baxter St., New York.

HARDWARE DEALERS

CAN RECOMMEND THE

CHAMPION METAL WINDOW SASH CHAINS

to their customers as a reliable substitute for
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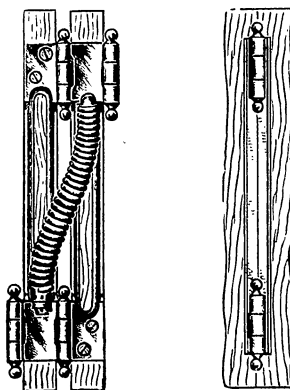
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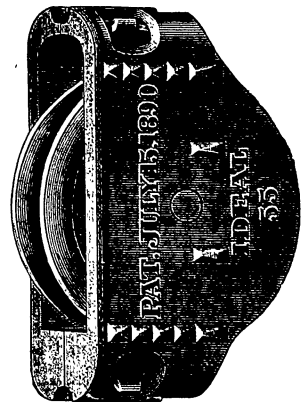
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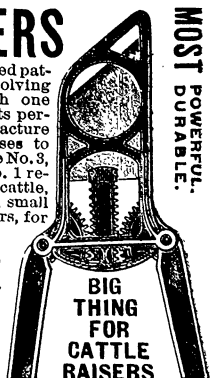
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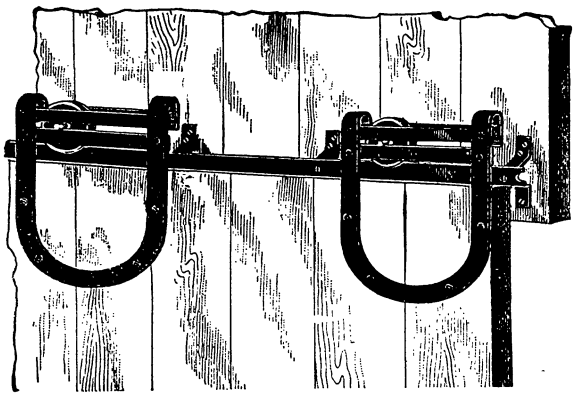
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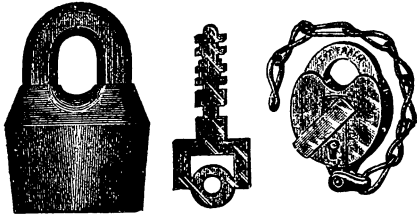
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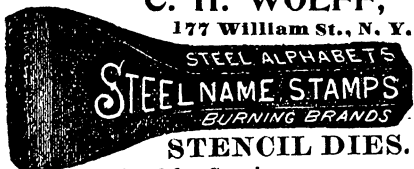
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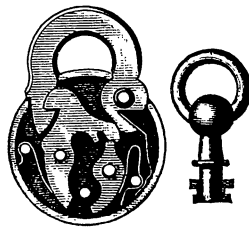
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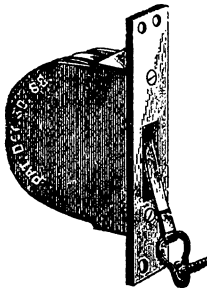
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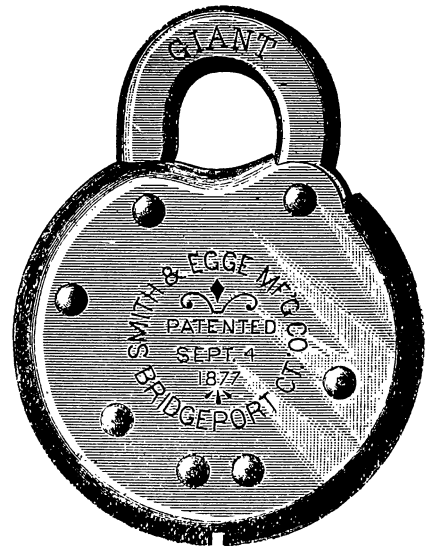
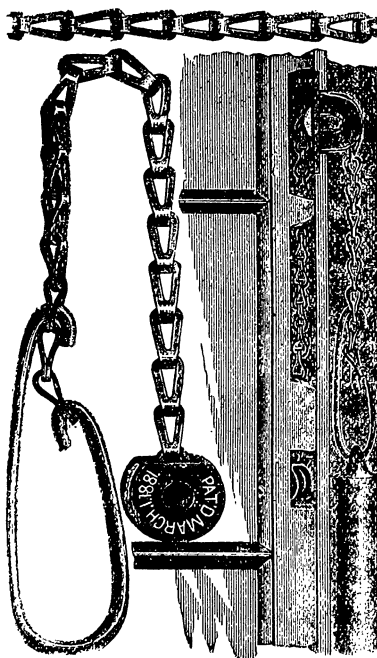
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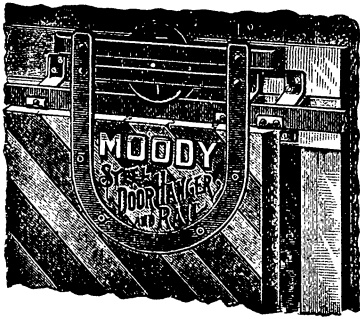
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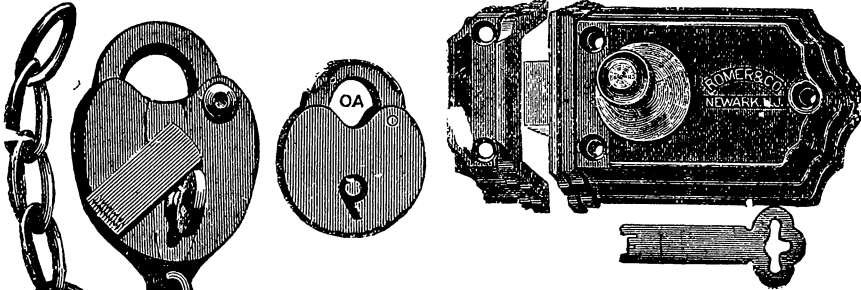


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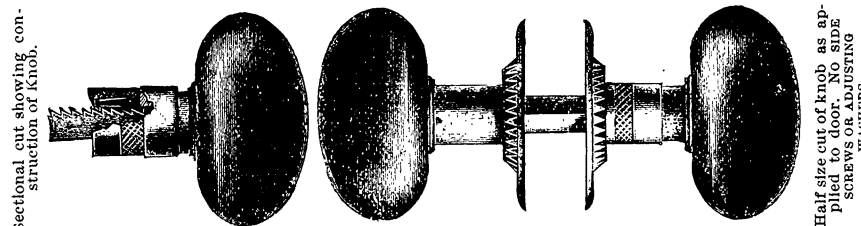


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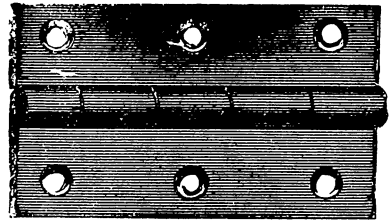
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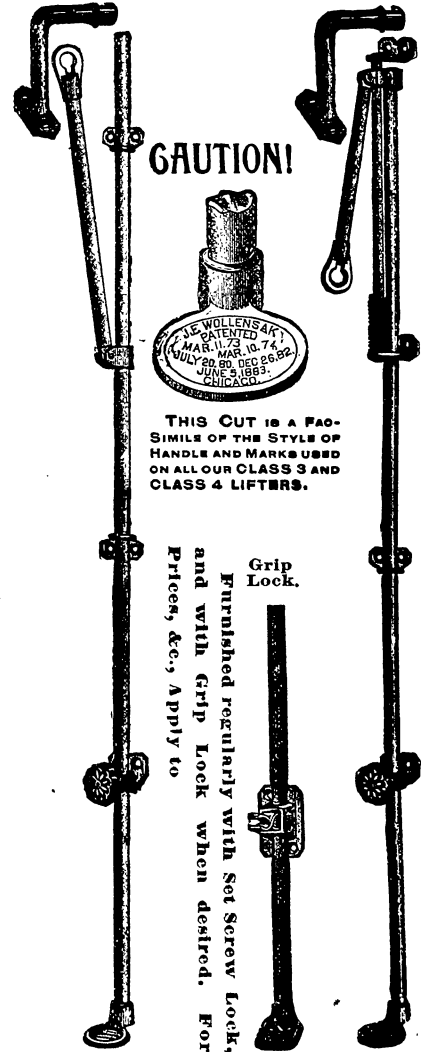
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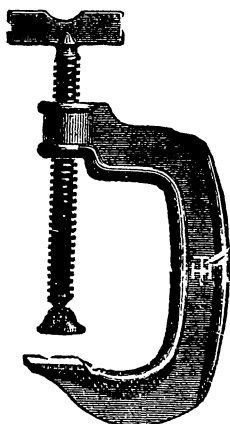
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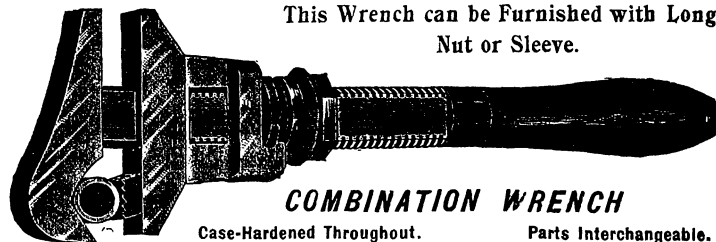
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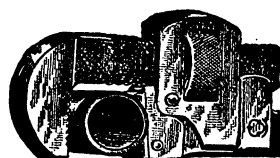
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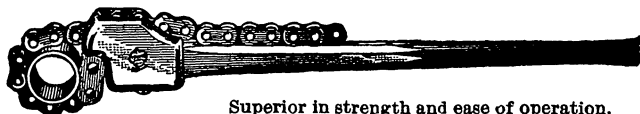
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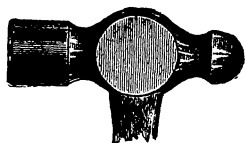


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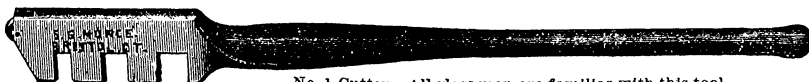
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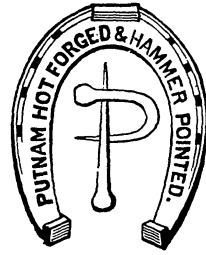
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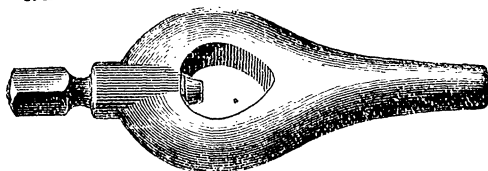
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3.	1/2	70	13.	1 1/4	1 80
4.	3/4	80	14.	1 1/2	2 10
5.	1	80	15.	1 3/4	2 75
6.	1 1/4	95	16.	2	3 25
7.	1 1/2	95	17.	2 1/4	4 00
8.	1 3/4	1 10	18.	2 1/2	5 00
9.	2	1 20	19.	2 3/4	6 00
10.	2 1/4	1 35	20.	3	7 00

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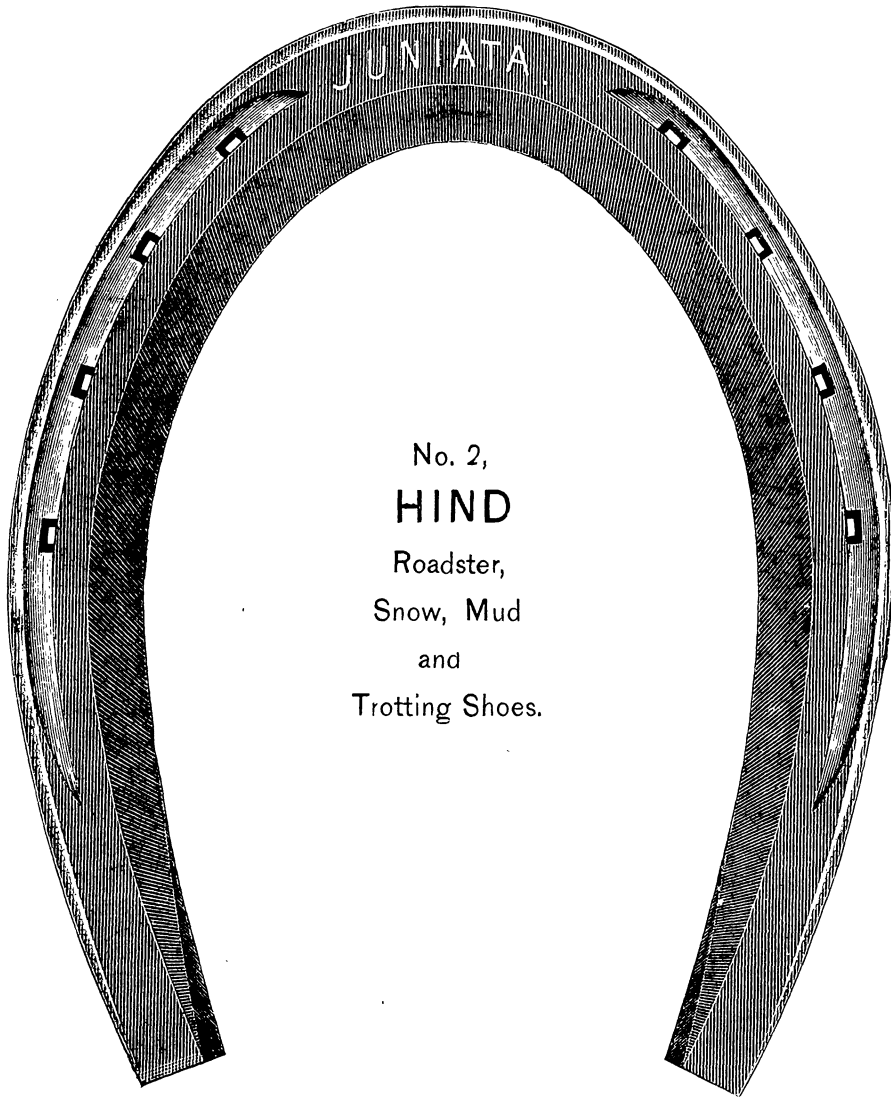
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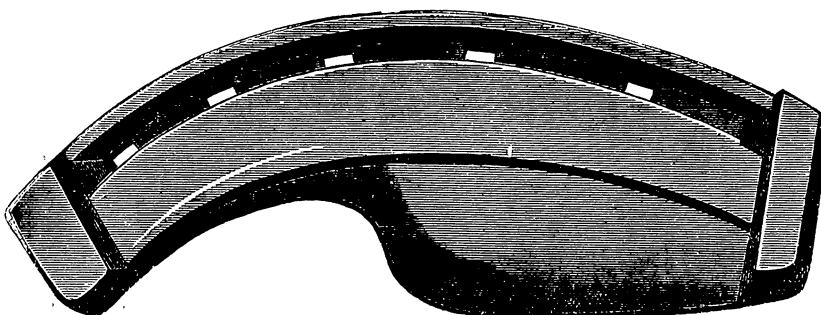
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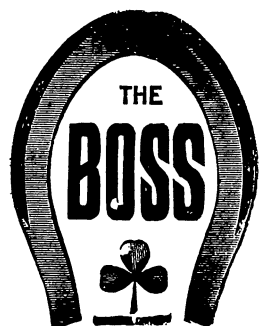
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HORSE SHOES.

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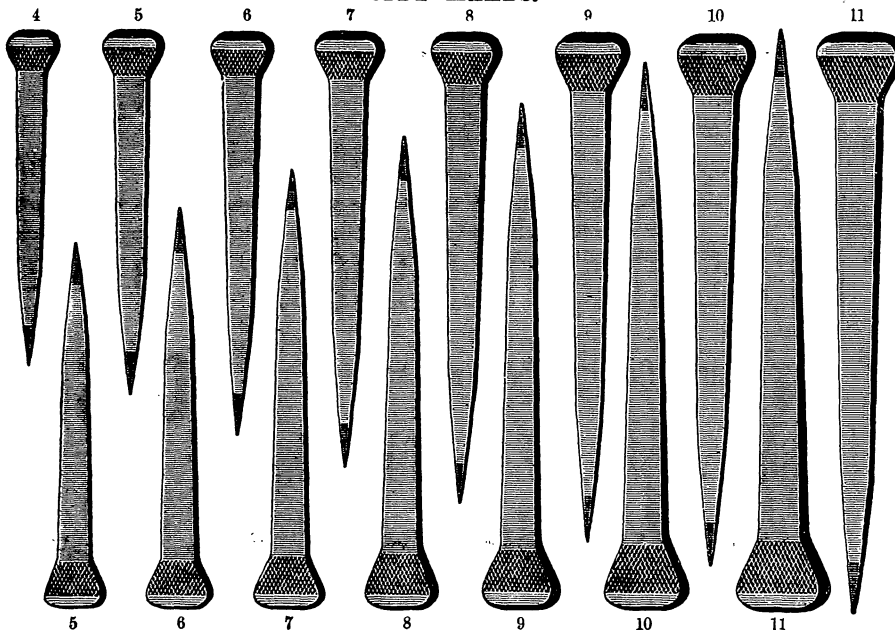
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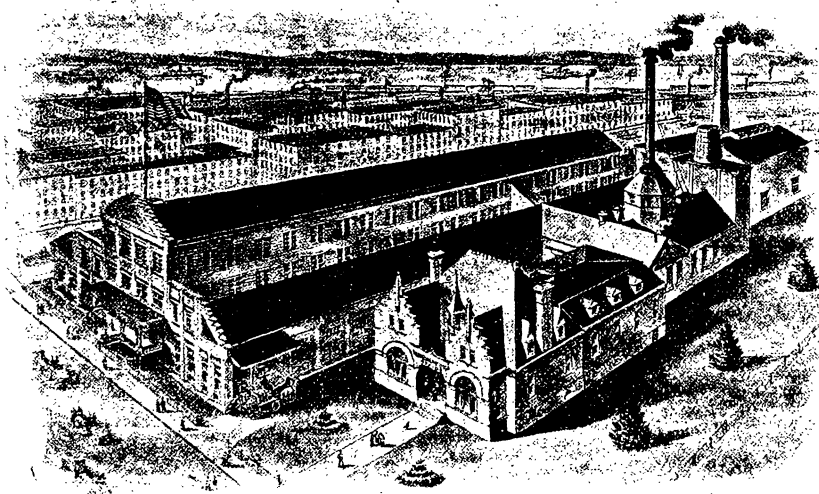
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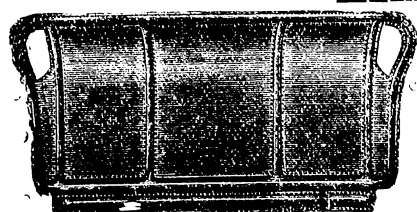
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FINE QUALITY

DASHES

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Manufacturers of
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—ALSO—
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Send for Circulars.
360 Worcester St. Boston, Mass. Die for Welding Sharp Calks.

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CRESCENT HORSE SHOE
IRON CO.

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Cut One-half Size.
Sample pair sent to any hardware or saddlery firm by addressing

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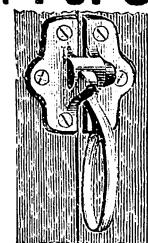
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"CONROY"

Refrigerator Door

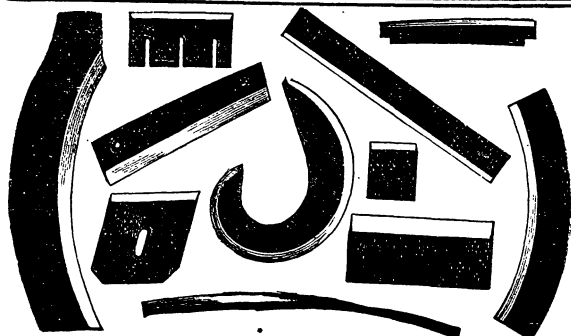
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Pat. Dec. 15, '85

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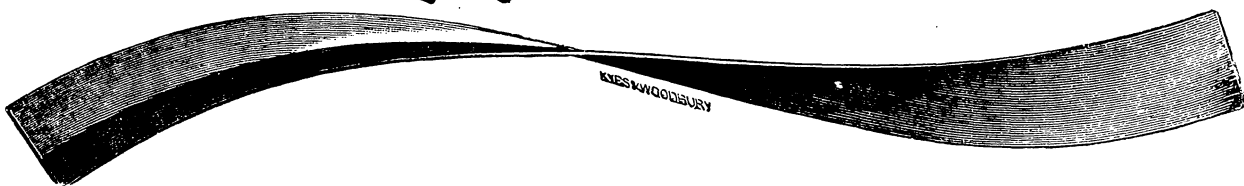
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Manufacturers of MACHINE KNIVES.

Shear Blades and Strips, Moulding Cutter Plate, Die Stock for Leather, Cloth and Paper Cutting Dies. Lawn Mower and Hay Cutter Knives of every description.

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Etc., showing how the Steel is laid.



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FOR ANTHRACITE AND BITUMINOUS MINING

SEAMLESS BRASS COLLAR
BRASS HINGE
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No SOLDERING

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SAMPLE 15¢.

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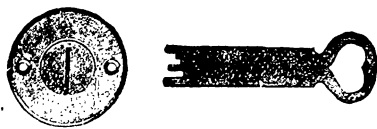
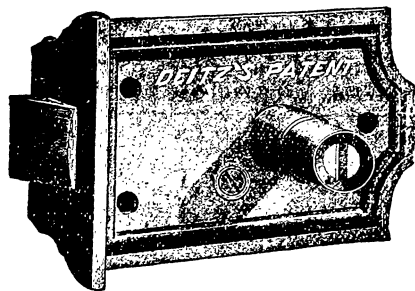
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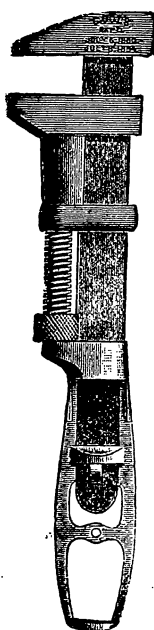
N. Y. Office, 108 Chambers St., W. H. QUINN, Manager

A. E. DEITZ

No. 109 Latch.

J. C. McCARTY & CO., Agents,
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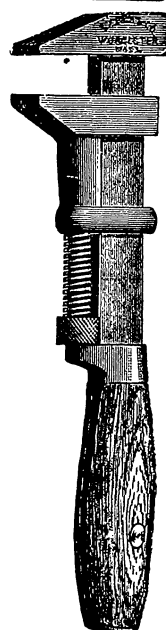
Factory, **BROOKLYN, E. D., N. Y.**

**L. COES'**

Genuine Improved
KNIFE HANDLE
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Screw Wrenches

MANUFACTURED BY
COES WRENCH CO.,
WORCESTER, MASS.



Established in
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Registered
March 31, 1874.

Patented July
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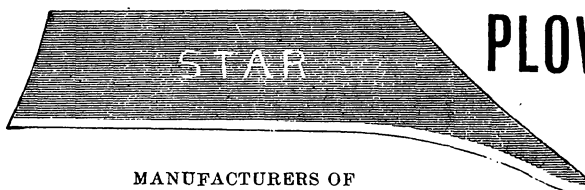
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Sectional View Illustrates our New Knife Handle, showing Malleable Iron Frame and Shank of Bar keyed into position.

✓ Straight Bar, Extra Long Nut for Screw in Jaw. ✓

The BEST MADE and STRONGEST WRENCH in the MARKET.

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Plow Moldboards,
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Containing complete instructions for Designing, Drawing, and Constructing Spur Wheels, Bevel Wheels, Lantern Gear, Screw Gear, Worms, &c. and the proper formation of Tooth Profiles. For the use of Machinists, Pattern Makers, Draughtsmen, Designers, Scientific Schools, &c. With many plates. By J. Howard Cromwell. 12mo, cloth. \$1.50.

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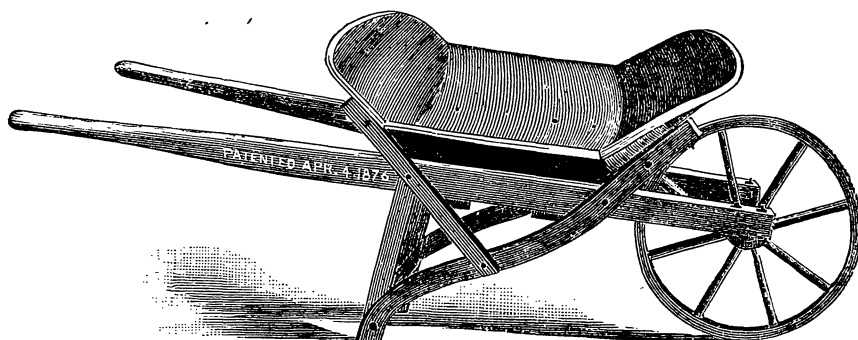
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WHEELBARROWS.

CAPITAL.

One of the best sellers on the market.



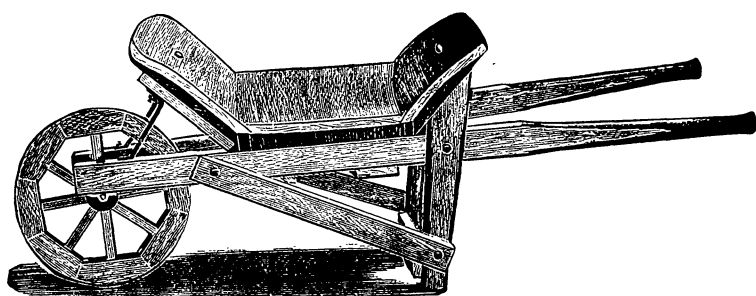
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CLIMAX.

One of the best of the cheaper barrows.

EUREKA.

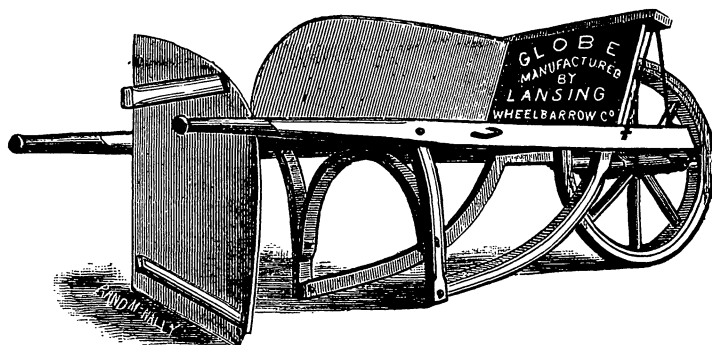
Similar to CLIMAX, but with iron hub wheel, trays cleated and bolted to handles.



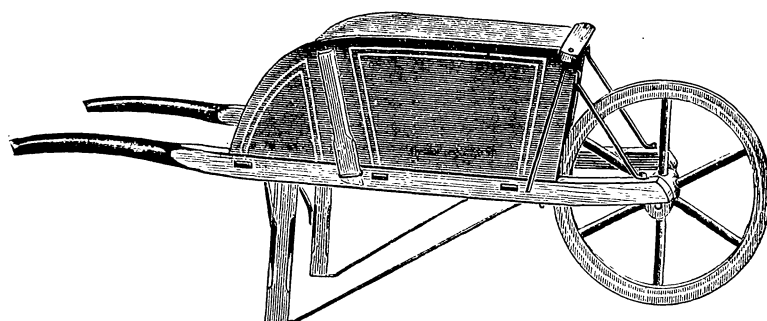
CLIMAX BOLTED BARROW.

GLOBE.

The old standby in the West. There have been many imitations, but no barrow sold in the West is so well made and nicely finished.



THE GLOBE PATENT GARDEN BARROW.



EASTERN GARDEN WHEELBARROW.

EASTERN.

This is the strongest and best painted garden barrow on the market. Used largely in New England.

Write for prices of anything in the way of Barrows or Warehouse Trucks.

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ALL TALK

And no sales never made business. The magnitude of our establishment devoted to the production of Wheelbarrows and Scrapers demonstrates very clearly, if not forcibly, that it was not ALL TALK but "Merit" and "Superiority" that made our business what it is to-day. If you're looking for the articles named send us your specification and we'll quote you bottom figures.

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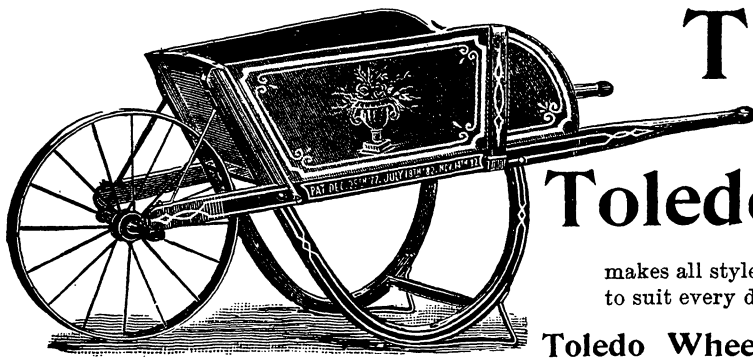
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OF

Toledo, = = Ohio,

makes all styles, grades and sizes of Wheelbarrows at prices to suit every dealer in such goods. Address

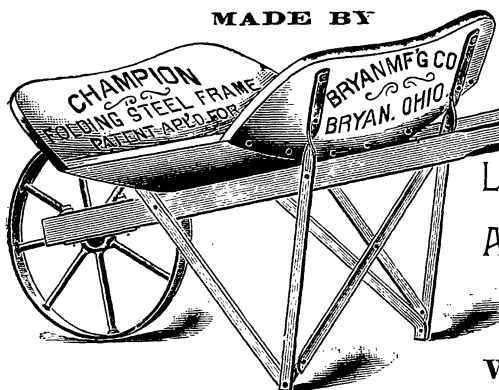
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Champion FOLDING STEEL FRAME Barrow.

✱ Wood or
Steel Tray. ✱

MADE BY



A Barrow that every one has been looking for but could never obtain. Read the following points and consider if it isn't to your interest to order sample lot.

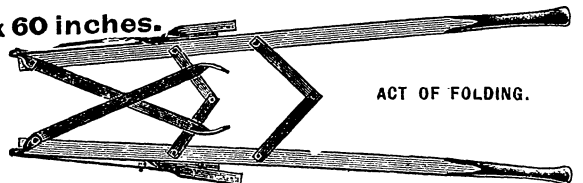
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LOW IN PRICE
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BARROW IN THE MARKET.

What do you
think of it?



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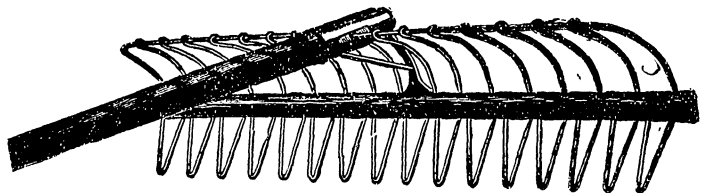


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LAWN RAKES. The "GEM" AND "DAVIS."

Both good and each the best. If you have not stocked up, better do so at once. Our prices are low.

SCHAEFFER & CO., Dayton, O.



ALL STEEL WHEELBARROWS & SCRAPERS

MANUFACTURED BY

AMERICAN STEEL SCRAPER CO.

1104 Court Street, SIDNEY, O.



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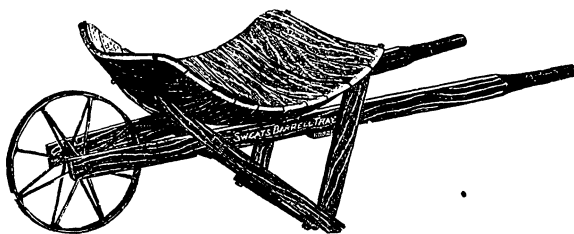
WE OFER YOU

The Newest and Best Wheelbarrow Made.

Its structure is NOVEL, STRONG and ENDURING. Barrel Tray, Bolted frame, Hubbard's Patent Steel Wheels.

Contractors, Builders and all users will appreciate it.

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B"



Patent Barrel
Tray.

MANUFACTURED ONLY BY

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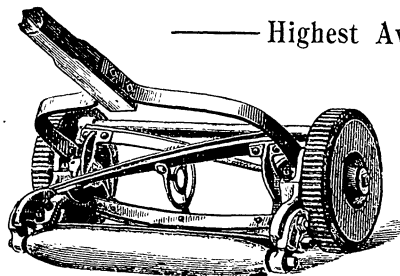
Withington & Cooley M'f'g Co.,
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Affording convenient source of supply for both Western and Eastern buyers. Stocks carried also in

CHICAGO and NEW YORK.

Genuine Philadelphia Lawn Mowers.

— Highest Award at the Field trial, World's Fair, Chicago, 1893. —

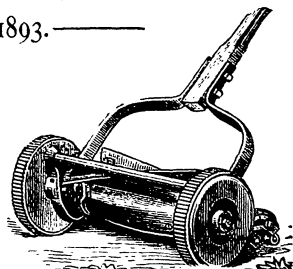


375,000 Machines Sold. ||

Hand, Pony and Horse Machines, Traveling Lawn Sprinkler, Lawn Sweeper and Collectors.

ACKNOWLEDGED STANDARD OF EXCELLENCE FOR 22 YEARS.

SEND FOR PRICE-LIST AND DISCOUNTS.



THE PHILADELPHIA LAWN MOWER CO., { Successors to Graham, Passmore & Co., } 3107 & 3109 Chestnut St., Philadelphia, Pa.

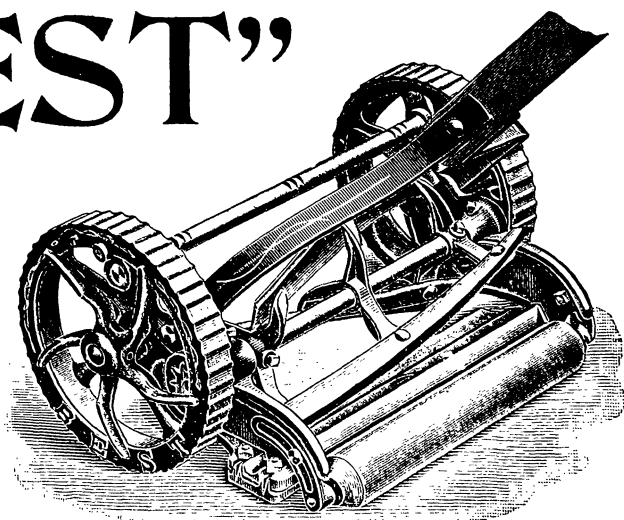
"THE BEST"

LAWN MOWER.

All wearing parts in sight, and easy to get at for oiling. Made of the highest grade of material throughout and is by far the best low priced machine on the market to-day.

GIVES ENTIRE SATISFACTION WHEREVER TRIED.

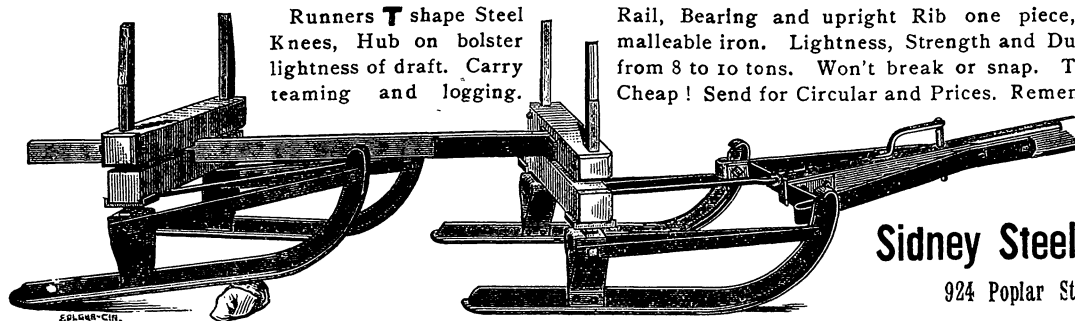
GET OUR PRICES BEFORE PLACING YOUR ORDERS.



DILLE & ANDERSON,

RICHMOND, IND.

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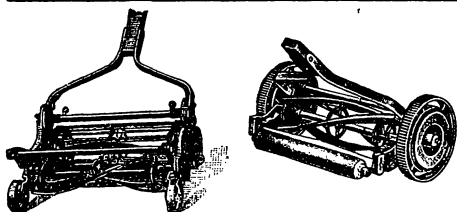
Runners T shape Steel Knees, Hub on bolster lightness of draft. Carry teaming and logging.

Rail, Bearing and upright Rib one piece, complete with Steel malleable iron. Lightness, Strength and Durability combined with from 8 to 10 tons. Won't break or snap. The boss for farm use Cheap! Send for Circular and Prices. Remember also that we make

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924 Poplar Street, SIDNEY, O.

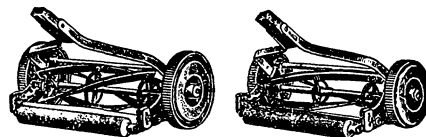


A new catalogue of the best line of

LAWN MOWERS

in the market is yours for the asking.

BLAIR MFG. CO.,
SPRINGFIELD, MASS.



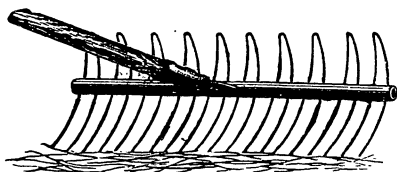
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OFFICE AND WORKS:

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NEW CONCRETE MIXING MACHINES.

Coal and Ash Buckets, Coaling Tubs, Coal and Coke Cars, Patent Tubular Frame Wheelbarrows, Furnace Charging Barrows and Cars, Sheet Iron Work of every description, Patent Power Punching Machines, Every Description of General Forgings, Dimpfel Blowers, Machine Work



Lead and Others Follow.

We manufacture the ORIGINALS; others follow! But to lead in prices and quality is the success of our Post-hole Diggers, Reversible Lawn-rakes, Spring Curry-combs, Saw-sets, etc.

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CANTON, OHIO.

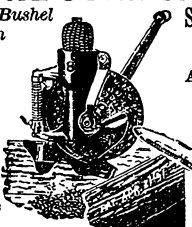
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Will Shell a Bushel of Corn in 4 Minutes.

**BEST
SHELLER**
in the world.

All Machines Warranted.

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Sample Sheller

\$3.00.

AGENTS WANTED.

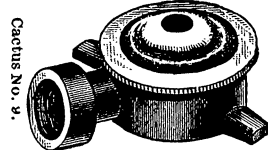
Ask your Merchant for it Send for circular.



Japanese No. 12, Adjust.

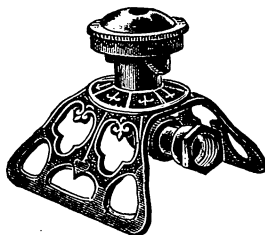
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We manufacture the BEST and CHEAPEST Lawn Sprinklers in the World.



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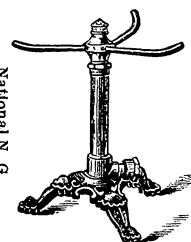
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Ette & Wenger Mfg. Co.

ST. LOUIS, MO.

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National N. G.

LITTLE GIANT

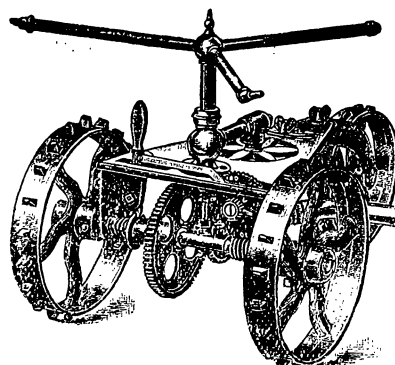
Traveling Lawn Sprinkler.

PATENTED.

Can be set to travel anywhere from 15 to 500 feet per hour, either on a straight line or in a circle, and can be gauged to throw water over a swath 5 to 50 feet in width.

Highest Award at World's Columbian Exhibition.

SEND FOR CIRCULAR.



PORTLAND LAWN SPRINKLER CO.,
PORTLAND, ME.

"THE HUSTLER"

Post Hole Digger.

Built for Business.

Combines simplicity with correct form for easy and rapid digging. Made in the most thorough manner of the best material. Has new points of advantage. We make 5 styles at as many prices.

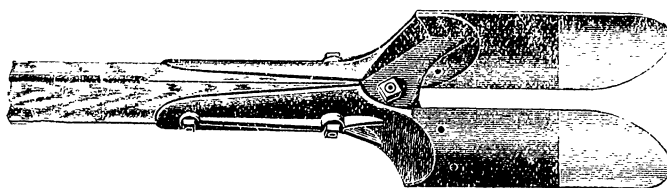
LAWN RAKES.

GARDEN RAKES.

CURRY COMBS.

LAWN SPRINKLERS.

POST HOLE DIGGERS.



—Send for NEW PRICES and Catalogue.

GIBBS MFG. CO., Canton, Ohio.

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Lawn Mowers is "PENNSYLVANIA."

Please Read following:—

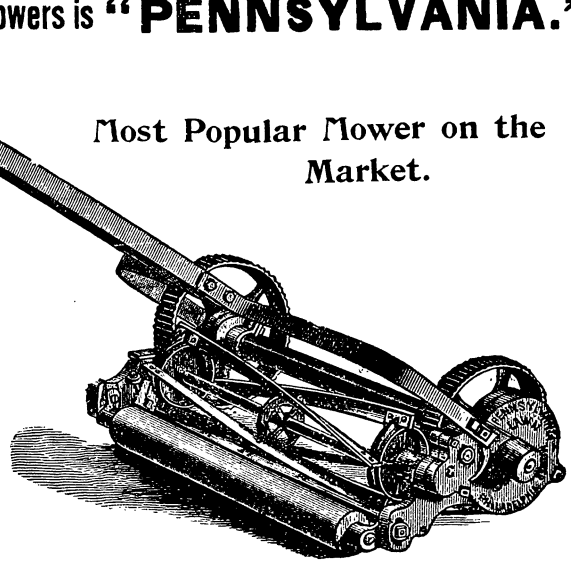
World's Columbian Exposition,
Messrs. SUPPLEE HARDWARE CO., Chicago, October 16, 1893.
Philadelphia, Pa.

GENTLEMEN:—I desire to state that we have used the **Pennsylvania Lawn Mowers** almost exclusively during the progress of the Fair with the most satisfactory results. The ease in working them was remarkable, and they did more work than we supposed was possible for Lawn Mowers to accomplish. The appearance and condition of our lawns, in comparison with others, prove the high grade and superiority of these Lawn Mowers.

A. B. FARQUHAR, Executive Commissioner.

Highest Award at World's Fair on our entire line of Lawn Mowers.

Supplee Hardware Co.,

503 Market Street, } PHILADELPHIA.
4 & 6 N. Fifth Street, }

Most Popular Mower on the Market.

McGuire's ♦ Diamond.

MANUFACTURED BY

Dille & McGuire Mfg. Co.,
RICHMOND, IND., U. S. A.

PRICE-LIST.

Wheels, 8 Inches High. Cutter, 5½ Inches Diameter.

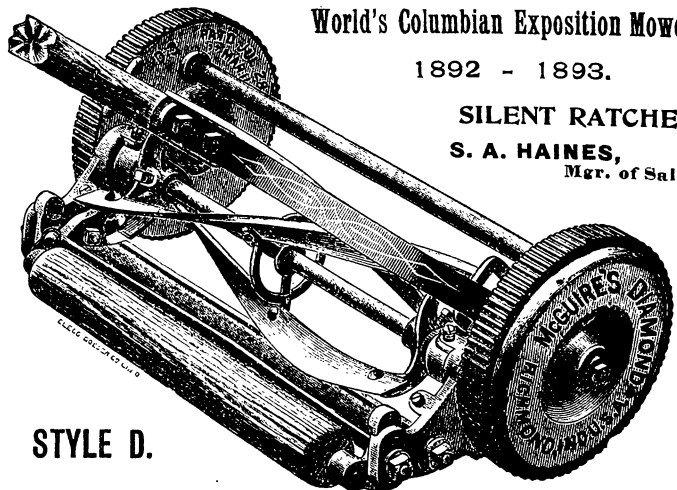
LENGTH.	LIST.	Discount to the
10 Inch	\$13.00	Trade,
12 "	14 00	70 per cent.,
14 "	15 00	F.O.B. Factory.
16 "	16 00	
18 "	17 00	

PHOSPHOR BRONZE JOURNAL BEARINGS. BEST QUALITY STEEL.

This is the Mower contracted for by the Chief of Construction at the Columbian Exposition; was used on the lawns at the World's Fair grounds during the preparatory season of 1892, and being approved by the Landscape Architects, was adopted exclusively for 1893.

If you wish a first-class Mower in all respects, one that is fully warranted,

—BUY MCGUIRE'S DIAMOND.—



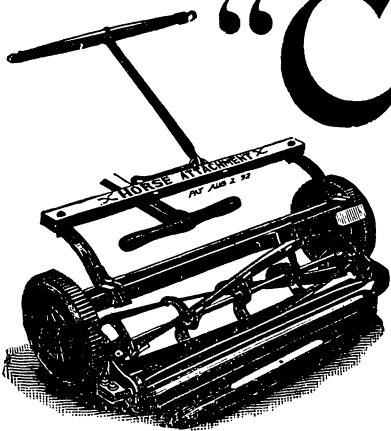
STYLE D.

— OFFICIAL —
World's Columbian Exposition Mower.
1892 - 1893.

SILENT RATCHET.
S. A. HAINES,
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"CHIEF" MOWER

With Horse Attachment.



TEN INCH TRACTION WHEEL. EXCELS FOR FINE QUALITY OF MATERIAL AND FINISH. SIMPLE ADJUSTMENTS, SMOOTH CUTTING.

THE ONLY FIRST-CLASS COMBINATION MOWER ON THE MARKET. PRICES LOW, TERMS REASONABLE.

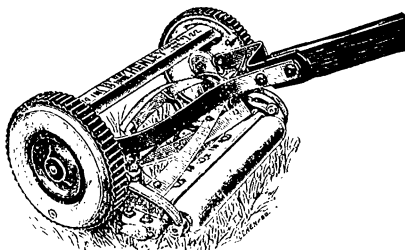
Mfd. by CHAMPION MFG. CO.,

LAWN MOWERS,
RAKES, Etc.257 Ft. Wayne Ave.,
Richmond, Ind.

HENLEY'S MOWERS

For Lawns and Parks

Are first class, high grade machines, made of the best materials, neat, symmetrical, strong and unexcelled in construction and ease of operation. Does perfect work. For prices, address



M. C. HENLEY, Sole Mfr., Richmond, Ind., U. S. A.

EASTERN REPRESENTATIVES: H. S. Earle, 110 and 112 N. Warren St., Syracuse, N. Y.; Wm. H. Cole & Sons, 13 S. Charles St., Baltimore, Md.; Carpenter & Bayles, 91 Chambers St., New York City.

Chadborn & Coldwell
Mfg. Co.,NEWBURGH, N. Y.,
—Sole Manufacturers of—

New Model
AND
Excelsior
LAWN
MOWERS
ALSO
The Rival,
The O K,
Etc., Etc.

Send for Illustrated Catalogue.



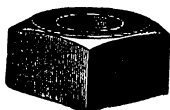
WROUGHT WASHERS

Every Washer
FLAT
With hole in
TRUE CENTER.



Packed in kegs for general trade, or in 1 and 5 lb. boxes for hardware trade.

MACHINE BOLTS.



HOT PRESSED NUTS.

Highest
Standard of
EXCELLENCE.

It will pay you to correspond with us.

MILTON MANUFACTURING CO.,

MILTON, PA.

Pennsylvania Bolt & Nut Co.
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MANUFACTURERS OF

REFINED BAR-IRON · MACHINE-BOLTS · TRACK-BOLTS · & BOLT-ENDS ·
LAG-SCREWS · GIMLET-POINTED COACH-SCREWS · HOT PRESSED & COLD PUNCHED SQUARE & HEXAGON NUTS ·
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STRUCTURAL & ELECTRICAL FORGINGS · BOILER & BRIDGE RIVETS · CAR FORGINGS & ARCH-BARS

COLDWELL LAWN MOWER COMPANY.

WORLD'S COLUMBIAN COMMISSION.

OFFICE OF THE

Director-General of the Exposition.

CHICAGO, ILL., U. S. A., Sept. 1, 1893.

Coldwell Lawn Mower Company,

Newburgh, N. Y.:

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J. M. SAMUELS,

Chief Dept. of Horticulture

Imperial, High Wheel, Standard, New York, Horse Mower.

3

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AWARDS.

NO ONE
RECEIVED
HIGHER,
BETTER OR
MORE
PREMIUMS.

A practical means of rapidly reaching absolutely accurate results without the mental wear of computing.

LADD'S DISCOUNT BOOK.

It gives at a glance the net of any sum at a great range of discounts, simple and complex, and it is accurate, rapid and practical. Price, \$3.00; Double Indexed Edition, \$4.00.

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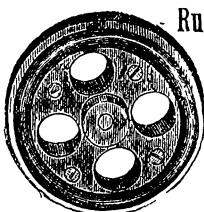
CALF WEANER "Shaw's Pat."

MADE BY

Carroll Muzzle Co.
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No wounds. No fretting.

Put Weaners on Calves and turn them out with the cows.
"It is the only machine I ever had that worked perfectly in every way."
A. R. ANDERSON, County Supervisor.



Rubber and Iron Wheels

Casters for Trucks,
Baskets and Boxes
Heavy Casters for
Mill use.

Catalogues free.

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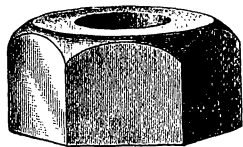
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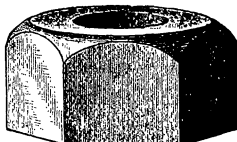
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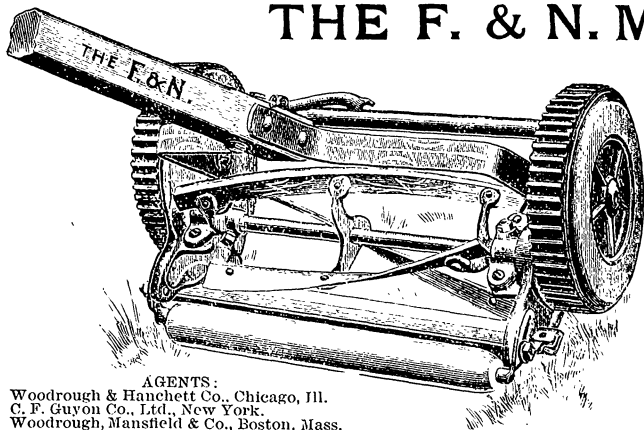
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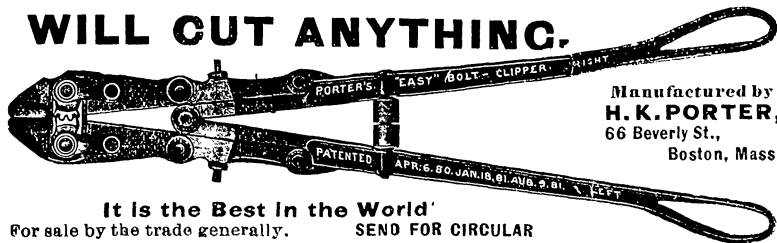
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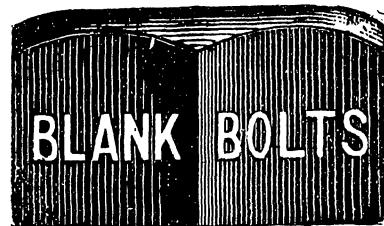
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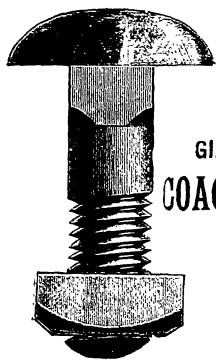


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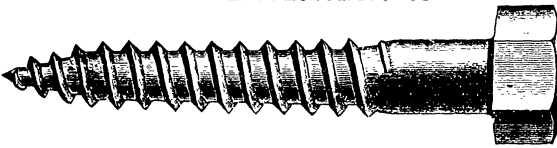
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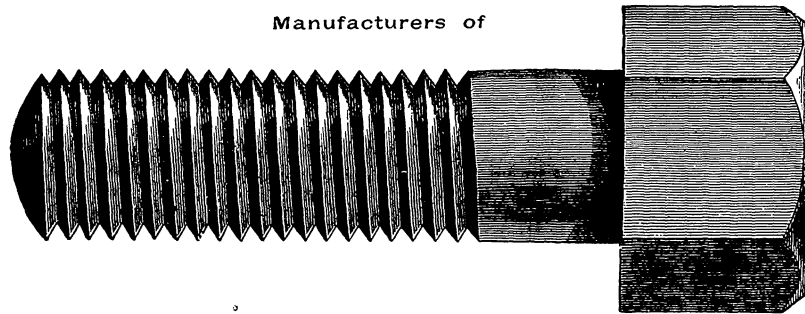
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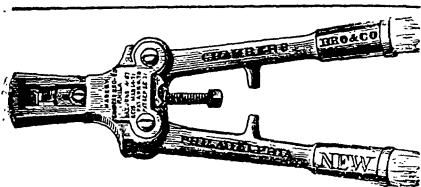


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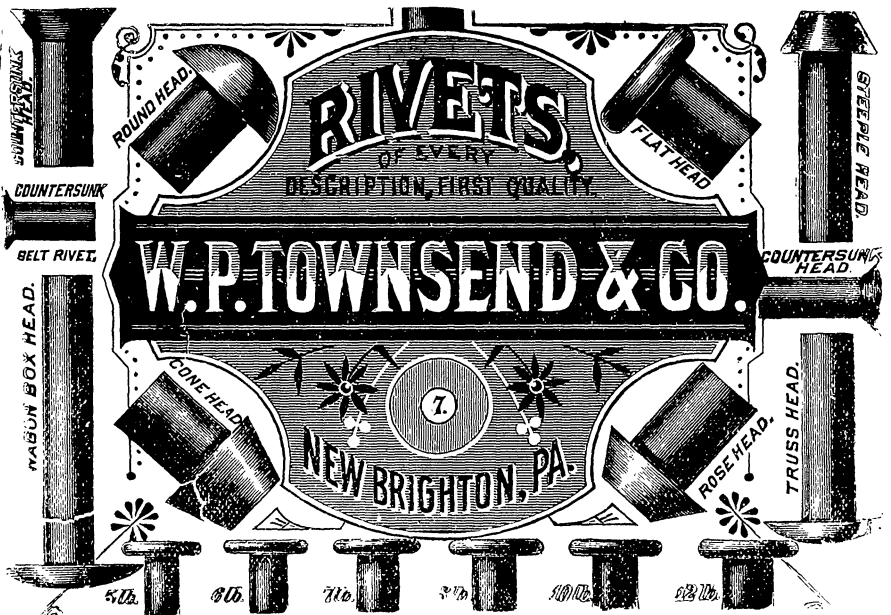
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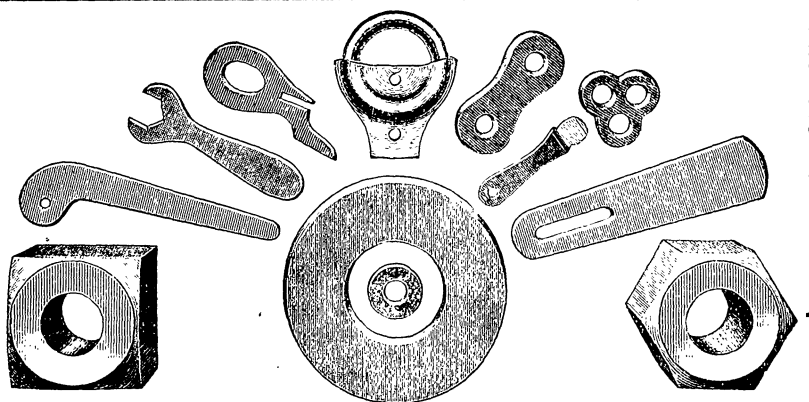
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Dille & McGuire Mfg. Co., Richmond, Ind.
- Egg Beaters.**
North Bros. Mfg. Co., Philadelphia
- Electric Bells and Supplies.**
Ostrander, W. R. & Co., 204 Fulton St., New York
Wollensak, J. F., Chicago, Ill.
- Electric Dynamo Machines.**
Edley Electric Mfg. Co., Windsor Conn
Hanson & Van Winkle Co., Newark, N. J.
- Elevators. Makers of.**
Link-Belt Engineering Co., Phila. Pa.
Horse, Williams & Co., Phila., Pa.
- Emery and Emery Wheels.**
Bell, Geo. E., 36 John St., N. Y.
N. Y. Belting & Packing Co., Ltd., N. Y.
Northampton Emery Wheel Co. Leeds, Mass.
Norton Emery Wheel Co., Worcester Mass.
Sturtevant Mill Co., Boston, Mass.
- Emery Wheel Dressers.**
Bay State Stamping Co., Worcester, Mass.
- Enamels.**
Nubian Iron Enamel Co., Cragin Ill
- Engineers and Contractors.**
Alken Henry, Pittsburgh, Pa.
Artificial Gas Engineering Co., Pittsburg, Pa.
Herrick, J. A., 284 Pearl St., N. Y.
Kennedy, Julian, Pittsburgh, Pa.
Laughlin, Alex. & Co., Pittsburgh, Pa.
Lean, D. R., Co., Pittsburgh, Pa.
McClure, Amster & Co., Pittsburgh, Pa.
Pittsburgh Iron & Steel Engineering Co., Pittsburgh, Pa.
Roberts, Frank C., Philadelphia, Pa.
Smythe, S. R. Co., Incorporated Pittsburg, Pa.
Swindell, W. & Bros., Pittsburgh, Pa.
- Engines. Gas.**
Otto Gas Engine Works, Phila., Pa.
Bollason Gas Engine, Havemayer Bldg., N. Y.
- Enamels. Steam. Makers of.**
Bass Foundry & Machine Works, Ft. Wayne, Ind.
Buckeye Engine Co., Salem, O.
Chandler & Taylor Co., Indianapolis, Ind.
Erie Engine Works, Erie, Pa.
Lane & Bodley Co., Cincinnati, O.
Norwalk Iron Works Co., So. Norwalk, Conn.
Penna. Diamond Drill & Mfg. Co., Birdsboro, Pa.
Phila. Engineering Works, Phila., Pa.
Phoenix Iron Wks. Co., Meadville, Pa.
Southward Foundry and Machine Co., Phila., Pa.
Tod, William & Co., Youngstown, O.
Wetherill, Robt. & Co., Chester, Pa.
- Exhaust Tumblers.**
Sweester, W. A., Brockton, Mass
- Expansion Belts.**
Boone, W. C. Mfg. Co., Boonton, N. J.
Church, Isaac, Toledo, O.
Steward & Romaine Mfg. Co., Phila. Pa.
- Faucets, Self-Measuring.**
Lane Bros., Poughkeepsie, N. Y.
- Faucets. Wooden. Makers of.**
John Sommer's Son, Newark, N. J.
- Feed-Water Heaters.**
Davis, I. B. & Son, Hartford, Conn.
Goubert Mfg. Co., 32 Cortlandt St., N. Y.
Harrison Safety Boiler Wks., Phila. Pa.
National Pipe Bending Co., New Haven, Conn.
Taunton Locomotive Mfg. Co., Taunton, Mass.
Webster, Warren & Co., Camden, N. J.
Whitlock Coll Pipe Co., Elmwood, Conn.
- Fencing. Iron and Wire.**
Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Clinton Wire Cloth Co., Clinton, Mass.
Gilbert & Bennett Mfg. Co., 42 Cliff St., Kilmer Mfg. Co., Newburgh, N. Y.
Mast, Foss & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.
- Fiber Ware.**
Standard Fiber Ware Co., Mankato, Minn.
- Files. Importers of.**
Moss, F. W., 90 John, N. Y.
- Files and Rasps. Manufacturers of.**
Arcade File Works, Anderson, Ind.
Sanker & White, Troy, N. Y.
- Barnett, G. & H., 41 & 43 Richmond Phila.**
McCauley File Co., Philadelphia.
Nicholson File Co., Providence R. I.
- Fire Brick. Makers of.**
Borgner, Cyrus, Philadelphia, Pa.
Gardner, Jas. & Son, Cumberland, Md.
Kreischer B. & Sons, Foot E. Houston, St.
McLeod & Henry Co., Troy, N. Y.
Maurer, H. & Son, 420 E. 25d, N. Y.
Ostrander Fire Brick Co., Troy, N. Y.
Solomon, Jao. M. Wilmington, Del.
Sientinae, M. L. & Bro., Woodbridge.
- Fire Sets.**
Troy Nickel Works, Troy, N. Y.
- Fishing Tackle.**
Dane, Stoddard & Kendall, Boston, Mass.
- Flint.**
Crystal Mills Co., Chester, Mass
- Flint and Emery Paper.**
Baeder, Adamson & Co., Phila., Pa.
- Flour Sifters.**
Meyers, F. J. Mfg. Co., Covington, Ky.
- Flue Cleaners.**
Mackey, Jas. T., St. Louis, Mo.
- Feeder Cutters.**
Silver Mfg. Co., Salem, O.
- Forges. Portable. &c.**
Bullock Bellows Co., Cleveland, O.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Empire Portable Forge Co., Lansingburg, N. Y.
Foss Mfg. Co., Springfield, Ohio.
Sturtevant, B. F. Co., Boston, Mass.
- Forgings. Iron and Steel.**
Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Steel-Cambria Iron Co., Johnstown, Pa.
Eastern Forge Co., Boston, Mass.
Frankford Steel Co., Phila. Pa.
Scranton Forging Co., Scranton, Pa.
U. S. Projectile Co., Brooklyn, N. Y.
- Foundry Facings.**
S. Obermayer Co., Cincinnati, O.
Smith, J. D. Fdy. Supply Co., Cinn., O.
Solomon, Jno. M., Wilmington, Del.
- Foundry Riddles.**
Casey, W. S. 65 Fulton, N. Y.
- Foundry Supplies.**
Colliau, Victor, Detroit, Mich.
Diamond Clamp & Flask Co., Richmond, Ind.
S. Obermayer Co., Cincinnati, O.
Smith, J. D. Fdy. Supply Co., Cinn., O.
- Friction Clutches.**
Keystone Clutch & Mch. Wks., Phila., Pa.
Moore & White Co., Philadelphia, Pa.
- Friction Cone.**
Evans Friction Cone Co., Boston, Mass
- Furnaces, Foundry.**
Byram & Co., Detroit, Mich.
- Garden Tools.**
Dunlap, C. W., Box 2703, New York
- Gas Producers.**
Wood, R. D. & Co., Philadelphia, Pa.
- Gas & Steam Fitters' Supplies.**
Pancoast, Henry B. & Co., Phila., Pa.
- Gauge, Rolling Mill.**
Haines Gauge Co., Philadelphia, Pa.
- Gear Cutters.**
D. E. Whiton Mach. Co., New London, Conn.
- Gears.**
Boston Gear Works Boston, Mass.
Poole, Robt. & Son Co., Baltimore, Md.
U. S. Projectile Co., Brooklyn, N. Y.
- Glass Boards.**
Canton Saw Co., Canton, O.
- Glass Cutters.**
Monroe, S. G., Bristol, Conn.
- Glass Tubes.**
Ashcroft Mfg. Co., 111 Liberty St., N. Y.
- Glue.**
Baeder, Adamson & Co., Phila., Pa.
Dodd, A. W. & Co., Gloucester, Mass.
Kuscia Cement Co., Gloucester, Mass.
- Grass Catchers.**
Supplier Hardware Co., Phila., Pa.
- Grinding and Polishing Machines.**
Herrick & Cowell, New Haven, Conn.
Norton Emery Wheel Co., Worcester Mass.
- Grinding Mills.**
Foss Mfg. Co., Springfield, O.
- Grindstone Dressing Machinery.**
Blake & Johnson, Waterbury, Conn.
- Grindstones.**
Cleveland Stone Co., Cleveland, O.
- Gun Implements.**
Union Hdw. Co., Torrington, Conn.
- Gunpowder. Makers of.**
Lafin & Rand Powder Co., 29 Murray St., N. Y.
- Hand Carts.**
Lansing Wheelbarrow Co., Lansing, Mich.
- Handles.**
New York Mallet and Handle Wks. 456 E. Houston St., N. Y.
- Hangers, Door.**
Chicago Spring Butt Co., Chicago, Ill.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
- Lane Bros., Poughkeepsie, N. Y.**
Victor Mfg. Co., Newburyport, Mass.
- Hardware Comm'n Merchants.**
Dochter, Martin, 88 Chambers, N. Y.
Field, Alfred & Co., 93 Chambers St., N. Y.
Graham, John H. & Co., 111 Chambers St., New York.
Jacobus, W. H., 90 Chambers, N. Y.
- Hardware Manufacturers.**
Dunlap, C. W., Box 2703, New York.
Russell & Frwin Mfg. Co., Chambers St., New York.
Stearns, E. C. & Co., Syracuse, N. Y.
Union Mfg. Co., 103 Chambers, N. Y.
Yale & Towne Mfg. Co., Stamford, Conn.
- Hardware Mfrs. Agents.**
Bincham, W. Co., Cleveland, O.
Clarke, Thomas, St. John, N. B.
Graham, John H. & Co., 113 Chambers, McCoy, Jos. F. Co., 28 Warren St., N. Y.
Sickles, Sweet & Lyon, 35 Barclay, N. Y.
- Hardware Specialties.**
Acme Shear Co., Bridgeport, Conn.
Selden Machine Co., New Haven, Conn.
Berger Bros., Philadelphia, Pa.
Clark Mfg. Co., Buffalo, N. Y.
Empire Portable Forge Co., Lansingburg, N. Y.
Enterprise Mfg. Co., Philadelphia, Pa.
Ette & Henger Mfg. Co., St. Louis, Mo.
Gwiner Mfg. Co., Hamilton, O.
Haines & Zimmerman, Phila. Pa.
Hart, H. C. Mfg. Co., Detroit, Mich.
Johnson, S. C., Racine, Wis.
Knapp & Cowles Mfg. Co., Bridgeport, Conn.
North Bros. Mfg. Co., Philadelphia, Pa.
Peabody & Parks, Troy, N. Y.
Welland, Chas., 149 Chambers St., N. Y.
Wilson, J. Fred, Worcester, Mass.
- Harness Snaps.**
Covert Mfg. Co., West Troy, N. Y.
Coverts' Saddlery Wks., Farmer, N. Y.
Fitch, W. & E. T., New Haven, Conn.
- Hay Knives.**
Holt, Hiram, Co., E. Wilton, Me.
- Hoisting Machines.**
Box, Alfred & Co., 314 Green, Phila.
Jrowa Hoisting & Conveying Mch. Co., Cleveland, Ohio.
Fulton Iron & Engine Wks., Detroit, Mich.
Harrington, E., Son & Co., Phila.
Lane Bros., Poughkeepsie, N. Y.
Lidgerwood Mfg. Co., 96 Liberty, N. Y.
Maris & Beekley, Philadelphia.
More Mfg. & Fdy. Co., Milwaukee, Wis.
Morse, Williams & Co., Phila.
Sellers, Wm. & Co., Phila. and N. Y.
Spiegel, J. G., Reading, Pa.
Yale & Towne Mfg. Co., Stamford, Ct.
- Hollow Ware.**
Bronson Supply Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleveland, O.
Stuart & Peterson Co., Phila., Pa.
- Hollow Ware, Aluminum.**
Illinois Pure Aluminum Co., Lemont, Ill
- Horse Nails. Makers of.**
Capewell Horse Nail Co., Hartford, Conn.
National Horse Nail Co., Vergennes, Vt.
Putnam Nail Co., Neponset, Boston, Mass.
- Horse and Mule Shoes. Makers of.**
Bryden Horse Shoe Co., Catsaqua, N. Y.
Burden Iron Co., Troy, N. Y.
Crescent Horse Shoe & Iron Co., Max Meadows, Va.
Diamond State Iron Co., Wilmington, Del.
Old Dominion Iron & Nail Works Co., Richmond, Va.
Pawnee Horse Shoe Co., Poughkeepsie, N. Y.
Rhode Island Perkins Horse Shoe Co., Providence.
Shoenberger & Co., Pittsburgh, Pa.
Standard Horse Shoe Co., Boston, Mass.
- Hose.**
Cleveland Rubber Works, Cleveland, O.
N. Y. Belting & Packing Co., Ltd., 16 Park Row, N. Y.
- Hose Clamps.**
Clancy, J. R., Syracuse, N. Y.
- Hydrants, &c.**
McLean, John, 296 & 298 Monroe, N. Y.
- Hydraulic Forging.**
U. S. Projectile Co., Brooklyn, N. Y.
- Hydraulic Jacks.**
Dudgeon, Richard, 24 Columbia, N. Y.
Watson & Stillman, 204 E. 43d, N. Y.
- Ice-Cream Freezers.**
Clement & Dunbar, Phila., Pa.
North Bros. Mfg. Co., Phila., Pa.
Packer, C. W., Philadelphia, Pa.
White Mountain Freezer Co., Nashua, N. H.
- Injectors.**
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., New York
Sherwood Mfg. Co., Buffalo, N. Y.
- Insurance, Boiler.**
Hartford Steam Boiler Inspection & Insurance Co., Hartford Conn.
- Iron and Steel, Swedish.**
Lundberg, Gustaf, Boston, Mass.
Mills, A. & Co., 1 Broadway, N. Y.
- Iron Commission Brokers.**
Corning, Edw. & Co., 29 B'way, N. Y.
Cotton, Barclay W. & Co., Phila.
Eating, Edw. J., Philadelphia.
Hogan, John L. & Co., Philadelphia Pa.
Hoffman, J. W. & Co., Philadelphia.
Levis, Henry & Co., Philadelphia.
Keeley, Jerome & Co., Philadelphia.
Lee, J. Tatnall & Co., Philadelphia.
Muir, J. J., 480 Walnut, Philadelphia.
Pilling & Crane, Philadelphia, Pa.
Wister, L. & H. & Co., Phila., Pa.
- Iron Ore.**
Naylor & Co., 45 Wall, N. Y.
Samuel, Frank, Philadelphia, Pa.
- Iron. Merchants.**
Barnes, O. K. & Co., Philadelphia, Pa.
Borden & Lovell, 70 West, N. Y.
Bussettus & Cuniffe, Philadelphia.
Corning Edw. & Co., 29 B'way, N. Y.
Cox, Justice, Jr., Philadelphia.
Cotton, Barclay W. & Co., Phila.
Hoffman, J. W. & Co., Philadelphia.
Leonard, J., 449 West St., N. Y.
Naylor & Co., 45 Wall St., N. Y.
Nicolls, Wheeler & Co., Philadelphia.
Ogden & Wallace, 85 Elm St., N. Y.
Pierson & Co., 29 Broadway, N. Y.
Thomson, W. H. & Co., Phila., Pa.
Wallace, Wm. H. & Co., Albany & Washington streets, N. Y.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wilson, E. H. & Co., Philadelphia.
- Iron. Importers.**
Abbott, Wheelock & Co., N. Y. and Boston
Lundberg, Gustaf, Boston, Mass.
- Iron, Sheet. Manufacturers of.**
Cambridge Iron & Steel Co., Cambridge
W. Dewees Wood Co., Lim., McKeesport, Pa.
- Ironwork. Ornamental.**
Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Lange Fence & Wire Co., St. Louis, Mo.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Mast, Foss & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.
- Little Bottom.**
Diamond Hdw. Co., Boston, Mass.
- Keys.**
Wollensak, J. F., Chicago, Ill.
- Ladders, Rolling.**
Coburn Trolly & Track Mfg. Co., Holyoke, Mass.
- Ladies.**
Detroit Fdy. Equipment Co., Detroit, Mich.
- Lamps.**
Plume & Atwood Mfg. Co., New York.
Standard Lighting Co., Cleveland, O.
- Lamp Stoves.**
Grazier Stove Co., Chelsea, Mich.
Plume & Atwood Mfg. Co., 18 Murray Street, New York.
- Lanterns.**
Bull Stamping Co., Detroit, Mich.
Steam Gauge & Lantern Co., Syracuse, N. Y.
- Lathes.**
Draper Machine Tool Co., Worcester, Mass.
Johnson, Israel H., Jr., & Co., Philadelphia, Pa.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Lathing, Wire.**
Clinton Wire Cloth Co., Clinton, Mass.
N. J. Wire Cloth Co., Trenton, N. J.
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Laundry Machines.**
Johnson, S. C., Racine, Wis.
- Lawn Mowers.**
Blair Mfg. Co., Springfield, Mass.
Chadborn & Coldwell Mfg. Co., Newburgh, N. Y.
Champion Mfg. Co., Richmond, Ind.
Coldwell Lawn Mower Co., Newburgh, N. Y.
Dille & Anderson, Richmond, Ind.
Dille & McGuire Mfg. Co., Richmond, Ind.
Enterprise Mfg. Co., Philadelphia, Pa.
F. & N. Mfg. Co., Richmond, Ind.
Hensley, M. C., Richmond, Ind.
Mast, Foss & Co., Springfield, O.
Philadelphia Lawn Mower Co., Philadelphia, Pa.
Stearns, E. C. & Co., Syracuse, N. Y.
Supplier Hdw. Co., Phila. Pa.
- Lawn Rakes.**
Gibbs Mfg. Co., Canton, Ohio.
Konler, F. E. & Co., Canton, O.
Schaeffer & Co., Dayton, Ohio.
- Lawn Sprinklers.**
Ette & Henger Mfg. Co., St. Louis.
Gibbs Mfg. Co., Canton, Ohio.
McGowan, John H. Co., Cincinnati & Portland Lawn Sprinkler Co., Portland, Me.
- Leather Parts.**
Greene, J. Frank, 278 Water St. New York.
- Lemon Squeezers.**
Ripley Mfg. Co., Unionville, Conn.
- Letters and Figures, Metallic.**
White, A. A. & Co., Providence, R. I.
- Letters, Paper.**
Tablet & Ticket Co., Chicago, Ill.
- Levels.**
Davis & Cook, Watertown, N. Y.
Richardson, O. F., & Son Athol, Mass.
- Locks & Knobs. Manufacturers of.**
Oelts, A. E., 97 Chambers, N. Y.
Reading Hdw. Co., Reading, Pa.
Romer & Co., Newark, N. J.
Smith & Egge Mfg. Co., Bridgeport, Conn.
Yale & Towne Mfg. Co., Stamford, Conn.

Machinery.

Am. Tool Works, Cleveland, Ohio.
Barnes, W. F. & John, Rockford, Ill.
Sement, Miles & Co., Philadelphia, Pa.
Bignell, C. E., 46 Dey, N. Y.
Knall & Keeler Mfg. Co., St. Louis, Mo.
Birmingham Iron Foundry, Birmingham, Conn.
Bliss, E. W. Co., Brooklyn, N. Y.
Rozert, Jno. L., Flushing, N. Y.
Bridgeport Mch. Tool Works, Bridgeport, Conn.
Biggs, Marvin, 12 Broadway, N. Y.
Carlin's Sons, Thos., Allegheny, Pa.
Cinn. Milling Mch. Co., Cincinnati, Ohio.
Clapp, G. O. M., 74 Cortlandt, N. Y.
Detrick & Harvey Mch. Co., Baltimore, Md.
Fitchburg Mch. Works, Fitchburg, Mass.
Garvin Mch. Co., Laight & Canal Sts.
Gould & Eberhardt, Newark, N. J.
Hamilton Mch. Tool Co., Hamilton, O.
Harrington, E. Son & Co., Phila. Pa.
Henderson, A. L., Wilmington, Del.
Hendey Machine Co., Torrington, Ct.
Hill, Clarke & Co., Boston, Mass.
Howard & Morse, 45 Fulton St., N. Y.
Johnson, Israel H., Jr., & Co., Phila.
Jones & Lamson Mch. Co., Springfield, Vt.
Longgrove & Co., Philadelphia, Pa.
McCabe, J. J., 68 Cortlandt, N. Y.
Machinery Supply Co., Rochester, N. Y.
Manville, E. J. Mch. Co., Waterbury, Conn.
National Machinery Co., Lima, Ohio.
Newark Mch. Tool Works, Newark, N. J.
New Haven Mfg. Co., New Haven, Conn.
Niles Tool Wks., 138 Liberty St., N. Y.
Pittsburgh Mfg. Co., Pittsburgh, Pa.
Place, Geo., 120 Broadway, N. Y.
Poole, Robt. & Son Co., Baltimore, Md.
Powell Planer Co., Worcester, Mass.
Fratt & Whitney Co., Hartford, Conn.
Scrimshaw Tool & Supply Co., N. Y.
Scranton Supply & Mchry. Co., Scranton, Pa.
Sellers, Wm. & Co., Phila.
Seyfert's Sons L. F., Philadelphia, Pa.
Stephens, J. & Co., Cincinnati, O.
Stow Flexible Shaft Co., Ltd., Phila.
Toomer, Frank, Philadelphia, Pa.
Wetherill, Robert & Co., Chester, Pa.
Wickes Br. S., Saginaw, Mich.
Wilson, W. A., Rochester, N. Y.

Machinery for Hardware Manufacturers.
Adt, Jno. & Son, New Haven, Conn.

Machine Knives.
Loring Coes & Co., Worcester, Mass.
Loyd, John, 558-562 Water St., N. Y.

Machine Tools.—See machinery.

Machine Work.
Papping, J., 68th St., & 11th Ave., N. Y. City.

Machinists' Scales.
Coffin & Leighton, Syracuse, N. Y.
Starrett, L. S., Athol, Mass.
Valentine Tool Co., Hartford, Conn.

Machinists' Tools and Supplies.
King, J. M. & Co., Waterford, N. Y.
Sellers, Wm. & Co., Inc., Phila.

Mallets.
N. Y. Mallet & Handle Works, N. Y.

Mangles.
Johnson, S. C., Racine, Wis.

Manufacturing Sites.
Illinois Central R. R., Chicago, Ill.

Measuring Tapes.
Keuffel & Esser Co., 127 Fulton St., N. Y.
Lufkin Rule Co., Saginaw, Mich.

Mechanical Instruction.
Correspondence School of Mechanics
Scranton, Pa.

Metallic Ceilings.
Penn. Iron Roofing & Corrugating Co., Phila., Pa.

Metals.
Fearing, Wm. S., 100 Chambers, N. Y.
Hendricks Bros., 49 Cliff, N. Y.
Naylor & Co., 46 Wall, N. Y.

Metal Brokers.
American Metal Co., N. Y.

Metallurgists.
Britton J. Blodgett, Phil

Milling Machines.
Cin. Milling Mch. Co., Cincinnati, Ohio.

Mining Knives.
Palmer Hdw. Mfg. Co., Troy, N. Y.

Mine Lamps.
Darby, Edw. & Sons, Phila. Pa.
Leonard, B. E., Scranton, Pa.

Mining Screens.
Harrington & King Perforating Co., Chicago, Ill.
Howard & Morse, 45 Fulton, N. Y.

Models, Makers of.
Franklin, H. H. Mfg. Co., Syracuse, N. Y.
Ideal Machine Works, Hartford, Conn.
Rhodes, L. E. Co., Hartford, Conn.

Molding Sand.
Obermayer, S. Co., Cincinnati, O.

Money Drawers.
Sun Mfg. Co., Greenfield, O.

Motors, Water and Electric.
O. & C. Electric Co., 402 and 404 Greenwich St., N. Y.
Dallett, Thos. H. & Co., Phila., Pa.

Nail Machinery.
Pittsburgh Mfg. Co., Pittsburgh, Pa.

Nails (Cut) and Spikes.
Borden & Lovell, 70 West, N. Y.
Cumberland Nail & Iron Co., Phila.
Oxford Iron Co., 81 Washington, Pottstown Iron Co., Pottstown, Pa.
Riverside Iron Wks., Wheeling, W. Va.
Valley Steel Co., St. Louis, Mo.

Nickel Platers' Supplies.

Electro Mfg. Co., Windsor, Conn.
Danson & Van Winkle Co., Newark, N. J.
Zucker & Levett Chemical Company, 10 to 14 Grand St., N. Y.

Barry Shapes, Rollers of.
Bowland, William & Harvey, Frankford, Philadelphia

Novelty Manufacturers.
Franklin, H. H. Mfg. Syracuse, N. Y.
Ideal Machine Works, Hartford, Conn.

Lat Machines.
Donham Nut Mch. Co., Unionville, O.

Nuts, Bolts, & Co., Makers of.
American Bolt Co., Lowell, Mass.
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Eastern Forge Co., Boston, Mass.
Jaskell, Wm. H. Co., Pawtucket, R. I.
Mt. Carmel Bolt Co., Mt. Carmel, Conn.
Pennsylvania Bolt & Nut Co., Lebaun, Pa.
Port Chester Bolt and Nut Co., Port Chester, N. Y.
Russell, Burdell & Ward, Port Chester, N. Y.
Sternberg, J. B. & Son, Reading, Pa.
Wilson, J. Fred., Worcester, Mass.
Wm. H. Haskell Co., Pawtucket, B. I.

Oil Cans and Lubricators.
Sherwood Mfg. Co., Buffalo, N. Y.

Oilers.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Oil Stones.
Pike Mfg. Co., Pike Station, N. H.

Oil Stoves.
Glazier Stove Co., Chelsea, Mich.

Orange Shears.
Henry, J. T., Mfg. Co., Hamden, Conn.

Ores.
Walter, Francis, Philadelphia, Pa.

Ex Shoes.
Scranton Forging Co., Scranton, Pa.

Packing.
Morrison, Robt., St. Louis, Mo.
N. Y. Belting & Packing Co. Ltd., N. Y.

Padlocks.
Ames Sword Co., Chicopee, Mass.
Fraim, E. T., Lancaster, Pa.
Hillebrand & Wolf, Phila., Pa.

Paints.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Garry Iron & Steel Roofing Co., Cleveland, O.

Paint Burners.
Dangler Stove & Mfg. Co., Cleveland, O.

Paint Cans.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Pants Stretcher.
Covert Mfg. Co., West Troy, N. Y.

Patent Solicitors.
Howson & Howson, Phila. & Wash'ton.
Jenner, H. W. T., Washington, D. C.
Stocking, E. B., Washington, D. C.

Peanut and Coffee Roaster.
Olsen, A. B., Kansas City, Mo.

Perforated Metal.
Clinton Wire Cloth Co., Clinton, Mass.
Harrington & King Perforating Co., Chicago, Ill.
Hendrick Mfg. Co., Ltd., Carbondale, Pa.

Phosphor Bronze.
Phosphor Bronze Smelting Co., Limited, 612 Arch, Philadelphia.

Phosphor Tin.
Rescort Phosphorized Metal Co., Philadelphia, Pa.

Blank & Naumann, 516 Pearl, N. Y.

Picks and Mattocks.
Flumo, Fayette K., Philadelphia, Pa.

Pig Iron.
Gouston, C. B. & Co., Philadelphia, Pa.
Montour Iron & Steel Co., Danville, Pa.
Naylor & Co., 46 Wall, N. Y.
Pilling & Crane, Philadelphia, Pa.
Samuel, Frank, Philadelphia, Pa.

Pig Iron Storage.
Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.

File Drivers.
Vulcan Iron Wks., Chicago, Ill.

Pipe Bent.
National Pipe Bending Co., New Haven

Pipe Cutting and Threading Machines.
Signal & Keeler Mfg. Co., St. Louis, Mo.
Merrill Mfg. Co., Toledo, O.
Pancoat Henry B. & Co., Philadelphia.
Saunders's Sons, D., Yonkers, N. Y.

Pipe Grips.
Prentiss Vise Co., 44 Barclay, N. Y.

Pipes, Fittings, & Co., Makers of.
McNab & Harin Mfg. Co., N. Y.

Pipe, Water and Gas, Makers of.
Cumberland Nail & Iron Co., Phila. Pa.
Donaldson Iron Co., Emaus, Pa.
Riverside Iron Works, Wheeling, W. Va.
Wood, R. D. & Co., Philadelphia, Pa.

Plane Irons, Manufacturers of.
Stuck Bros., Millbury, Mass.

Planes, Manufacturers of.
Stanley Rule & Level Co., N. Y.

Plated Ware.
Boarman, L. & Son, New Haddam, Ct.
Holmes & Edwards Silver Co., Bridgeport, Conn.
Rogers, Wm. Mfg. Co., Hartford, Ct.

Plate Iron and Steel, Mfrs of.
Etna-Standard Iron & Steel Co., Bridgeport, O.
Lukens Iron & Steel Co., Coatesville, Pa.

Mahon Valley Iron Co., Youngstown, Ohio.
Woodward-McLean Co., Pittsburgh, Pa.
Mollvain & Sons, Reading, Pa.
Pottstown Iron Co., Pottstown, Pa.
Pottsville Iron & Steel Co., Pottsville, Pa.
Singer, Nimick & Co., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Tellman Iron & Steel Co., Thurlow, Pa.
Wood Alan Co., Philadelphia.

Plating, Nickel, Brass and Silver.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Plow Shares.
Star Mfg. Co., Carpentersville, Ill.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Polishing Machines.
Watson & Stillman, 204 E. 43d, N. Y.

Post Hole Diggers.
Buckeye Mfg. Co., Union City, Ind.
Gibbs Mfg. Co., Canton, Ohio.
Graam, Jno. H. & Co., 113 Chambers St., N. Y.
Walter, L. & R. Co., Philadelphia, Pa.

Putty Nettings.
Sarnum, E. T., Detroit, Mich.
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
N. Y. Wire Cloth Co., Trenton, N. J.
"Silver Finish,"
Tyler Wire Wks. Co., W. S., Cleveland, O.
Wright & Colton Wire Cloth Co., Worcester, Mass.

Powder.
Lafin & Rand Powder Co., 29 Murray New York Powder Co., 62 Liberty St., N. Y.

Power Hack Saws.
Millers Falls Co., 93 Beade St., N. Y.

Saw Hammer.
Jelden Mach. Co., New Haven, Conn.
Jenett & Eisenhardt, Philadelphia.
Dupont Mfg. Co., St. Johnsbury, Vt.
Jenkins & Lingie, Bellefonte, Pa.

Presses, Dies, & Co.
E. W. Bliss Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Serracorte Mch. Co., Bridgeport, N. J.
Stark Mch. & Tool Co., Buffalo, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Waterbury Mch. Co., Waterbury, Conn.

Presses, Power, Makers of.
Bliss, E. W. Co., Brooklyn, N. Y.
Manville, E. J. Mch. Co., Waterbury, Ct.
Stark Mch. & Tool Co., Buffalo, N. Y.
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.

Pulleys.
Keystone Clutch Mch. Wks., Phila., Pa.
Lake, J. H. & D. Co., Massillon, Ohio.
Reeves Pulley Co., Columbus, Ind.

Pulley Fixings.
Foley, J. W. & Co., Cincinnati, O.

Pumping Machinery.
Dean Bros. Steam Pump Works, Indianapolis, Ind.
Lucas, C. O. & Co., Greenville, Ohio.
McGowan, J. H. & Co., Cincinnati, O.
Maslin, J. & Son, Jersey City, N. J.
Norwalk Iron Wks. Co., So. Norwalk, Conn.
Southark Fdy. & Mch. Co., Phila., Pa.
Valley Pump Wks., Easthampton, Mass.
Worthington, Henry R., 86 & 88 Liberty St., N. Y.

Pumps, Makers of.
Bellevue Pump Co., Bellevue, Iowa.
Doming Co., Salem, O.
Douglas, W. B. & B., Middletown, Conn.
Maat, Foss & Co., Springfield, O.
Myers, F. E. & Bro., Ashland, O.

Punches and Shears, Hand and Power.
Bertsch & Co., Cambridge City, Ind.
E. W. Bliss Co., Brooklyn, N. Y.
Cockburn Barrow & Mch. Co., Jersey City, N. J.
Crosby, G. A. & Co., Chicago, Ill.
Ferracorte Mch. Co., Bridgeport, N. J.
Henderson, A. L., Wilmington, Del.
Stark Mch. & Tool Co., Buffalo, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Wals & Rous Punch & Shear Co., Cincinnati, Ohio.
Waterbury Farrel Foundry and Mch. Co., Waterbury, Conn.
Watson & Stillman, 204 E. 43d, N. Y.

Rails, Old and New.
Perry, W. H. & Co., Providence, R. I.

Rat and Mouse Traps.
Eatey, W. S., 65 Fulton, N. Y.
Ripley Mfg. Co., Unionville, Conn.
Sun Mfg. Co., Greenfield, O.

Razors.
Electric Cutlery Co., 113 Chambers, N. Y.
J. R. Torrey Razor Co., Worcester, Mass.

Reels.
Hendryx, A. B. Co., New Haven, Conn.

Refrigerator Door Fasteners.
Conroy, P. J. & Co., Philadelphia.

Refrigerators.
Challenge Corn Planter Co., Grand Haven, Mich.
Monroe Refrigerator Co., Lockland, O.

Rivets.
Blake & Johnson, Waterbury, Conn.
Boyce Rivet Co., Muncie, Ind.
Burden Iron Co., Tr. y., N. Y.
Clark & Cowles, Plainville, Conn.
Cobb & Drew, Plymouth, Mass.
New England Screw Co., Boston, Mass.
Sternberg, J. B. & Son, Reading, Pa.
Townsend, W. P. & Co., New Brighton, Pa.

Riveting Machines.
Adt, Jno. & Sons, New Haven, Conn.

Rock Drills.
Rand Drill Co., 23 Park Place, N. Y.

Rolling Mill Machinery.
Birmingham Iron Fdry, Birmingham, Conn.
Booth, The Lloyd Co., Youngstown, O.
Leechburg Foundry & Mch. Co., Pittsburgh, Pa.
Mahoning Fdry & Mch. Co., Danville, Pa.
Morgan Construction Co., Worcester, Mass.
Robinson-Rea Mfg. Co., Pittsburgh.
Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.
Trethewey Mfg. Co., Pittsburgh, Pa.
Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.

Roll Lathes.
Totten & Hogg Iron & Steel Fdry Co., Pittsburgh, Pa.

Rolls, Chilled, Sand and Steel.
Booth, The Lloyd Co., Youngstown, O.
Garrison, A. Fdry. Co., Pittsburgh, Pa.
Seaman, Sleeth & Black, Pittsburgh.
Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.

Roofing.
Berlin Iron Bridge Co., E. Berlin, Conn.
Boston Bridge Works, Boston, Mass.
Cambridge Roofing Co., Cambridge, O.
Cincinnati Corrugating Co., Piqua, O.
Conns. H. W. Mfg. Co., Waterbury, Conn.
N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.

Rope and Web Goods.
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Wks., Farmer, N. Y.

Rope Wheels.
Crasson, Geo. V. Co., Philadelphia, Pa.

Rowlocks.
Newhall Ship Chandlery Co., 105 Chambers St., N. Y.

Rubber Goods.
Candfield, H. O., Bridgeport, Conn.

Rules, Manufacturers of.
Keuffel & Esser Co., 127 Fulton St., N. Y.
Lufkin Rule Co., Saginaw, Mich.
Stanley Rule & Level Co., 29 Chambers, N. Y.

Rust Preventive.
Bridgeport Gun Implement Co., 518-515 Broadway, N. Y.

Sand Paper.
Baeder, Adamson & Co., Phila., Pa.

Sash Balances.
Caldwell Mfg. Co., Rochester, N. Y.
Pullman Sash Balance Co., Rochester, N. Y.
Vanderbilt Sash Balance Co., Canandaigua, N. Y.

Sash Cords and Chains.
Morton, Thos., 65 Elizabeth, N. Y.
Osawan Mills Co., Norwalk, Conn.
Samson Cordage Works, Boston, Mass.
Smith & Egge, Mfg. Co., Bridgeport.

Sash Locks.
Columbian Sash & Door Lock Co., Wauson, Ohio.
Ives, H. B. & Co., New Haven, Conn.

Sash Pulleys.
Empire Portable Forge Co., Lansingburgh, N. Y.
Palmer Hardware Mfg. Co., Troy, N. Y.

Sash Weights.
Brown, E. E. & Co., Philadelphia, Pa.

Saw Filing Machines.
Disston, Henry & Sons, Philadelphia, Pa.

Saws, Makers of.
Butler Mfg. Co., Boston, Mass.
Disston, Henry & Sons, Phila., Pa.
National Saw Co., 96 Beade St., N. Y.
Simonds Mfg. Co., Fitchburg, Mass.

Saw Vises.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

Saw Sets.
Taintor Mfg. Co., 84-86 Chambers, N. Y.

Scales, Manufacturers of.
Buffalo Scale Co., Buffalo, N. Y.
Chattillon, John & Sons, 85-89 Cliff, N. Y.

Scrapers, Road.
Am. Steel Scraper Co., Sidney, Ohio.
Kilbourne & Jacobs Mfg. Co., Columbus, O.
Sidney Steel Scraper Co., Sidney, O.

Screens, Coal and Ore.
Hendrick Mfg. Co., Ltd., Carbondale, Pa.

Screens, Door and Window.
Phillips, A. J. & Co., Fenton, Mich.

Screw Cutting Machinery.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Screw Drivers.
Brown, E. H. & Co., New Haven, Conn.
Gay & Parsons, Augusta, Me.
Mayhew, H. H. Co., Shelbourne Falls, Mass.

Screw Plate and Pipe Cutter.
Jarecki Mfg. Co., Erie, Pa.

Screws, Makers of.
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Wm. H. Haskell Co., Pawtucket, Mass.
Miles, F. S., 205 Quarry, Philadelphia.
New England Screw Co., Boston, Mass.
Reynolds & Co., New Haven, Conn.
Russell & Erwin Mfg. Co., New York.
Worcester Machine Screw Co., Worcester, Mass.

Seroll Saws.
Barnes, W. F. & John, Rockford, Ill.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

Settle Stones and Whetstones.
Pike Mfg. Co., Pike Station, N. H.
Cleveland Stone Co., Cleveland, O.

Shafting, Makers of.
Crescon, Geo. V. Co., Philadelphia, Pa.
Fairmount Mch. Co., Philadelphia, Pa.
Fitzsimons & Co., Cleveland, Ohio.
Sellers, Wm. & Co., Inc., Phila. Pa.
Stow, Co. Mfg., Binghamton, N. Y.

Shaped Iron and Steel, Manufacturers of.
Etna-Standard Iron & Steel Co., Bridgeport, O.

Allentown Rolling Mill. Allentown, Pa.
Lockhart Iron & Steel Co., Pittsburg, Pa.
Passaic Rolling Mill Co., Paterson, N.J.
Pottsville Iron & Steel Co., Pottsville, Pa.
Roberts, A. & P. & Co., Phila., Pa.
The Phoenix Iron Co., Phila., Pa.

Shears and Scissors.

Aame Shear Co., Bridgeport, Conn.
Reinischs, R. Sons Co., Newark, N. J.

Sheet Iron and Steel, Manufacturers of.

Etna-Standard Iron and Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, Ohio.
Chess Bros., Pittsburg, Pa.
Mahoning Valley Iron Co., Livingston, Ohio.
Moorehead-McCleane Co., Pittsburg, Pa.
Pierston & Co., 29 Broadway, N. Y.
Singer, Nimick & Co., Ltd., Pittsburg, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Alan Wood Co., Philadelphia.
W. Dewees Wood Co., McKeesport, Pa.

Sheet Metal Work.

Clark & Cowles, Plainville, Conn.

Sheet Zinc.

Matthiessen & Hegeler Zinc Co., La Salle, Ill.

Shelf Brackets.

Koch, A. B. & Co., Peoria, Ill.

Slings.

Douglas, W. & B., Middletown, Conn.

Skates, Ice.

Dame, Stoddard & Kendall, Boston, Mass.
Lovell, Jno. P. Arms Co., Boston, Mass.
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.

Skates, Roller.

Henley, M. C. Richmond, Ind.
Union Hardware Co., Torrington, Conn.
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.

Smelting Works.

Reeves, Paul S., 760 S. Broad, Phila.

Soldering Coppers.

Clendenin Bros., Baltimore, Md.
Covert Mfg. Co., West Troy, N. Y.

Speaking Tubes.

Ostrander, W. R. & Co., 204 Fulton St., N. Y.
Wollensak, J. F., Chicago, Ill.

Specialties, Pat. Articles.

Kingslow, O., Cleveland, O.
Rhodes, L. E. Co., Hartford, Conn.

Spelter.

Matthiessen & Hegeler Zinc Co., La Salle, Ill.

Spoons and Forks.

Boardman, L. & Son, New Haddam, Conn.
Holmes & Edwards Silver Co., Bridgeport, Conn.
Rogers, The Wm. Mfg. Co., Hartford, Conn.

Sporting Goods.

Hartley & Graham, 313-315 B'way, N. Y.

Springs.

Clark & Cowles, Plainville, Ct.
Dunbar Bros., Bristol, Conn.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
Boland, Wm. & Harvey, Phila., Pa.
Sabin Machine Co., Montpelier, Vt.
Washburn & Moen Mfg. Co., Worcester, Mass.
Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.

Spring Hinges.

Chicago Spring Butt Co., Chicago, Ill.
Fullman Sash Balance Co., Rochester, N. Y.
Stover Mfg. Co., Freeport, Ill.
Van Wagoner & Williams Co., 14 Warren St., N. Y.

Stamped Ware.

Am. Stamping Co., 104 & 106 John St., New York.

Stamping Works.

Cleveland Stamping & Tool Co., Cleveland, O.

Staples.

Cobb & Drew, Plymouth, Mass.
Stickener E. H. & Co., Binghamton, N. Y.

Steam Gauges.

Ashcroft Mfg. Co., 111 Liberty St., N. Y.
Bristol Co., Waterbury, Conn.

Steam Hammers, &c., Makers of.

Dienelt & Eisenhardt, Philadelphia.
Dudgeon, Richard, 24 Columbia Street, N. Y.
Tretzwey Mfg. Co., Pittsburgh, Pa.

Steam Heating.

Webster Warren & Co., Camden, N. J.

Steam Separators.

Gouvert Mfg. Co., 32 Cortland St., N. Y.
Harrison Safety Boiler Wks., Phila., Pa.

Steel, Cold Rolled Strip.

Superior Steel Co., Pittsburgh, Pa.
Wilmot & Mobbs Mfg. Co., Bridgeport, Conn.

Steel Figures and Alphabets.

Hoefig, C. W., 52 Fulton St., N. Y.
Reynard, W., 61 Fulton St., N. Y.
Wolff, C. H., 177 William St., N. Y.

Steel Importers.

Abbott, Wheelock & Co., N. Y. and Boston.
Hobson, Francis, Seaman & Co., 9 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, Eng. land, or 91 John, N. Y.
Milne, A. & Co., 1 Broadway, N. Y.
Newton & Shipman, 83 John, N. Y.
Wetherell Bros., 93 Liberty St., N. Y.
Whitney, A. R. & Co., B'way, N. Y.
Wolff, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.

Steel (Mushet's Special).

Jones, B. M. & Co., Boston.

Steel Manufacturers.

Etna-Standard Iron & Steel Co., Bridgeport, O.
Bethlehem Iron Co., S. Bethlehem, Pa.
Baker, Herman & Co., 103 Duane St.
Carbon Steel Co., Pittsburg, Pa.
Chester Steel Castings Co., Phila., Pa.
Chrome Steel Works, Brooklyn, N. Y.
Crecent Steel Co., Pittsburgh, Pa.
Eiken & Co., Hazen, Germany.
Frankford Steel Co., Philadelphia.
Gautier Steel Department or Cambria Iron Co., Johnstown, Pa.
Hobson, Francis, Seaman & Co., 9 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, Eng. land, or 91 John, N. Y.
Kayser, Ellison & Co., Sheffield, Eng.
La Belle Steel Co., Pittsburgh, Pa.
Lukens Iron & Steel Co., Coatesville, Pa.
Moorehead-McCleane Co., Pittsburg, Pa.
Moss, F. W., 83 John N. Y.
Steel & Iron, 45 Wall, N. Y.
Pottsville Iron and Steel Co., Pottsville, Pa.
Rowland, Wm. & Harvey, Frankford Philadelphia.
Singer, Nimick & Co., Pittsburgh.
Stanley Works, New Britain, Conn.
Steel Iron Improvement Co., Pittsburgh, Pa.
Superior Steel Co., Pittsburg, Pa.
Taylor Iron & Steel Co., High Bridge, N. J.
Valley Steel Co., St. Louis, Mo.
Wordlaw, S. & C., Sheffield, Eng.
Wetherell Bros., 93 Liberty, N. Y.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Steel, Manufacturers' Agents.

Barnes, C. K. & Co., Philadelphia, Pa.
Corning, Edw. & Co., 29 B'way, N. Y.
Frasse Co., 19 Warren St., New York.
Landau, Jas. G. & Co., Phila., Pa.
Pierston & Co., 29 Broadway, N. Y.

Steel Rails, Manufacturers of.

Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Iron Co., Johnstown, Pa.
Montour Iron & Steel Co., Danville, Pa.
Riverside Iron Wks., Wheeling, W. Va.

Steel, Tools.

Frankford Steel Co., Philadelphia, Pa.
Jessop, Wm. & Sons, Sheffield, Eng. land, 91 John, N. Y.
Jones, B. M. & Co., Boston, Mass.
La Belle Steel Co., Pittsburgh, Pa.

Step Ladders.

Bicycle Step Ladder Co., Chicago, Ill.
Croissant, M., Albany, N. Y.

Stocks and Dies.

Armstrong Mfg. Co., Bridgeport, Conn.
Billings & Spencer Co., Hartford, Conn.
Butterfield & Co., Derby Line, Vt.
Hart Mfg. Co., Cleveland, O.
Saunders' Sons, D. Yonkers, N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Stove Linings.

Ostrander Fire Brick Co., Troy, N. Y.

Stove Pipe Thimbles.

Cheney, S. & Son Manlius, N. Y.

Stove Trimmings.

Troy Nickel Works, Troy, N. Y.

Stove Trucks.

Gwinner Mfg. Co., Hamilton, O.

Street Lamps.

Steam Gauge & Lantern Co., Syracuse, N. Y.

Strops.

Electric Cutlery Co., 118 Chambers, N. Y.
J. R. Torrey & Co., Worcester, Mass.

Structural Iron Work.

Berlin Iron Bridge Co., East Berlin, Conn.
Boston Bridge Wks., Boston, Mass.
Lindsay, Jas. G. & Co., Phila., Pa.
Wrought Iron Bridge Co., Canton, O.

Sulphuric Acid.

Matthiessen & Hegeler Zinc Co., La Salle, Ill.

Tacks, Brads, Staples, &c.

Atlas Tack Corporation, Boston, Mass.
Clendenin Bros., Baltimore, Md.
Cobb & Drew, Plymouth, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.

Taps and Dies.

Eutterfield & Co., Derby Line, Vt.
Carpenter, J. M., Tap & Die Co., Pawtucket, R. I.
Manning, Maxwell & Moore, 111 Liberty, St., N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Testing Laboratories.

Riehle Bros. Testing Mch. Co., Philadelphia.

Testing Machines.

Riehle Bros. Testing Mch. Co., Phila.

Theatrical Hardware.

Wollensak, J. F., Chicago, Ill.

Thill Springs.

Frost Thill Spring Co., Boston, Mass.
Sabin Machine Co., Montpelier, Vt.

Timber and Mineral Land.

Robertson, E. Co., Cincinnati, O.

Time Record.

Scattergood, H. W., Phila., Pa.

Tin Plate Machinery.

Lloyd Booth Co., Youngtown, Ohio.

Tinware.

Am. Stamping Co., 104 & 106 John St.,

Tire Upsetters.

Butts & Ordway, Boston, Mass.

Toe Calks, Steel.

Burke, P. F., Boston, Mass.

Tool Chests.

Am. Tool Co., 200 W. Houston St., N. Y.

Tool Racks.

Herrick, F. A. & Co., Jackson, Mich.

Tools.

Britton, Horace E., Stoughton, Mass.
Brown, R. H. & Co., New Haven, Conn.
Frasse Co., 19 Warren St., New York.
Fray, Jno. S. & Co., Bridgeport, Conn.
Mayhew, H. H. Co., Shelburne Falls, Mass.
Millers Falls Co., 98 Reade, N. Y.
Nicol & Co., Chicago, Ill.
Richardson, C. F. & Son, Athol, Mass.
Stanley Rule & Level Co., 29 Chambers, New York, N. Y.
Sturges, L. S., Athol, Mass.
Tower & Lyon, 95 Chambers St., N. Y.
Wilkinson, A. J. & Co., Boston, Mass.

Tools, Blacksmith and Wheelwrights.

Buffalo Forge Co., Buffalo, N. Y.
Butts & Ordway, Boston, Mass.
Champion Blower & Forge Co., Lancaster, Pa.
Plumb, Fayette R., Philadelphia, Pa.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Tools, Steam and Gas Fitters.

Saunders' Sons, D., Yonkers, N. Y.

Torches, Oil and Gasolene.

Danzler Stove & Mfg. Co., Cleveland, O.
Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.

Transom Lifters.

Wollensak, J. F., Chicago, Ill.

Trucks, Manufacturers of.

Clark, G. P., Windsor Locks, Conn.
Lansing Wheelbarrow Co., Lansing, Mich.

Tubes, Seamless Drawn Copper.

Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.
Randolph & Clowes, Waterbury, Conn.

Tubes, Steel.

Ellwood Shafting & Tube Co., Ellwood City, Pa.
Leng's John S. Son & Co., 4 Fletcher St., New York.
Shelby Steel Tube Co., Shelby, O.
U. S. Projectile Co., Brooklyn, N. Y.

Tumbling Barrels.

Henderson Bros., Waterbury, Conn.

Turnbuckles.

Central Iron & Steel Co., Brazil, Ind.
Cleveland City Forge & Iron Co., Cleveland, O.
Merrill Bros., Brooklyn, E. D.

Twist Drills, Makers of.

Cleveland Twist Drill Co., Cleveland.
Morse Twist Drill & Machine Co., New Bedford, Mass.
New Process Twist Drill Co., Taunton, Mass.
Standard Tool Co., Cleveland.

Valves, Gas, Water and Steam.

Best, Fox & Co., Pittsburgh, Pa.
Chapman Valve Mfg. Co., Boston.
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., 71 John, N. Y.
Lukensheimer Co., Cincinnati, O.
McNab & Harlin Mfg. Co., 66 John, N. Y.

Ventilating Fans.

Huyett & Smith Mfg. Co., Detroit, Mich.

Ventilator Appliances.

Howard & Morse, 45 Fulton, N. Y.

Vise Jaws.

Newark Mch. Tool Co., Newark, N. J.

Vices.

Athol Machine Co., Athol, Mass.
Capital Mch. Tool Co., Auburn, N. Y.
Hollands Mfg. Co., Erie, Pa.
Howard Iron Works, Buffalo, N. Y.
Millers Falls Co., 98 Reade St., N. Y.
Prentiss Vise Co., 44 Barclay, N. Y.
Tower & Lyon, 95 Chambers St., N. Y.
Van Wagoner & Williams Co., Warren St., N. Y.

Wagon Jacks.

Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Works, Farmer, N. Y.

Washers.

Haskell, Wm. H. Co., Pawtucket, R. I.
Milton Mfg. Co., Milton, Pa.
Sternbergh, J. H. & Son, Reading, Pa.

Washing Machines.

Benbow Mfg. Co., St. Louis, Mo.
Richmond & Cedar Works, Richmond, Va.

Water Meters.

Worthington, Henry R., 86 & 88 Liberty St., N. Y.

Water Wheels.

Poole, Robt. & Son Co., Baltimore, Md.
Wheeler, Arnold Metal Wheel Co., New London, Ohio.

Wheelbarrows.

Amer. Steel Scraper Co., Sidney, Ohio.
Byran Mfg. Co., Byran, Ohio.
Cockburn Barrow & Mch. Co., Jersey City, N. J.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Lansing Wheelbarrow Co., Lansing, Mich.
Sidney Steel Scraper Co., Sidney, O.
Sweatt Mfg. Co., Minneapolis, Minn.
Toledo Wheelbarrow Works, Toledo, Ohio.

Window Cord, Makers of.

Samson Cordage Works, Boston, Mass.

Wire, Manufacturers of.

Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Miller & Van Winkle, Brooklyn, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
New Haven Wire Mfg. Co., New Haven, Conn.
Salem Wire Nail Co., Salem, O.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester
Wheeler Bros., 83 Liberty St., N. Y.
Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.

Wire Cloth.

Barnum, E. T., Detroit, Mich.
Clinton Wire Cloth Co., Clinton, Mass.
Darby, Edward & Sons, Philadelphia.
Estey, W. S., 65 Fulton, N. Y.
Gilbert & Bennett Mfg. Co., 42 Cliff, N. Y.
Howard & Morse, 45 Fulton, N. Y.
N. J. Wire Cloth Co., Trenton, N. J.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros., Cortland, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
W. S. Tyler Wire Works Co., Cleve'd.

Wire Cutters.

Higginan Hdw. Co., Higginan, Conn.
King, J. M. & Co., Watertown, N. Y.

Wire Dies.

McFarland, Wm., Trenton, N. J.
Newton & Shipman, 83 John, N. Y.

Wire Fences.—See Fencing, Iron and Wire.

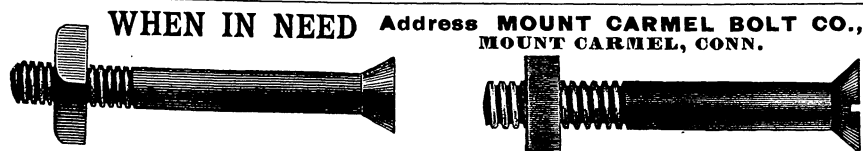
Wire Goods, Manufacturers of.

Darby, Edward & Sons, Phila.
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
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Alexander Bros.	39	Buffalo Forge Co.	126	Darby, Edw. & Sons	8	Haines & Zimmermann	85
Allentown Rolling Mills	29	Buffalo Scale Co.	104	Davis & Cook	64	Haines Gauge Co.	29
Almond, T. R.	43	Buhl Stamping Co.	91	Davis, I. B. & Son	32	Halk & Naumann	3
Am. Axe & Tool Co.	78	Bullock Bellows Co.	50	Davol, John & Sons	2	Halsey, Jas. T.	48
Am. Bolt Co.	117	Burden Iron Co.	107	Dayton Malleable Iron Co.	126	Halsey, W. S. & Co.	26
Am. Metal Co.	3	Burgess & Loxley	126	Dean Bros. Steam Pump Works	38	Hamilton Machine Tool Co.	40
Am. Pig Iron & Storage Warrant Co.	3	Burke, P. F.	109	Decker Mfg. Co.	117	Hammer & Co.	104
Am. Roll Paper Co.	72	Burr & Houston Co.	27	Deitz, A. E.	110	Hanson & Van Winkle Co.	32
Am. Screw Co.	11	Bussenius & Cunliffe	56	Deming Co.	66	Hardware Board of Trade	59
Am. Stamping Co.	95	Butler Mfg. Co.	84	Detrick & Harvey Machine Co.	53	Harrington, E. Son & Co.	52
Am. Steel Scraper Co.	112	Butterfield & Co.	48	Detroit Foundry Equipment Co.	30	Harrington & Richardson Arms Co.	84
Am. Tool Co.	65	Butts & Ordway	42	Diamond Clamp & Flask Co.	124	Harrison Safety Boiler Wks.	36
American Tool Works	56	Byram & Co.	25	Diamond Hardware Co.	97	Hart, H. C. Mfg. Co.	94
Ames Sword Co.	102	C. & C. Electric Co.	32	Diamond State Iron Co.	107	Hart Mfg. Co.	48
Andre, T. J.	66	Caldwell Mfg. Co.	102	Dienelt & Eisenhardt	44	Hartford Steam Boiler Insp. and Ins.	34
Ansonia Brass & Copper Co.	2	California Wire Works	5	Dille & Anderson	113	Hartley & Graham	1
Arcade File Works	70	Cambridge Iron & Steel Co.	24	Dille & McGuire Mfg. Co.	115	Hartzell, Geo. W.	105
Arcade Malleable Iron Co.	24	Cambridge Roofing Co.	16	Disston, Henry & Sons	69	Haskell, Wm. H. Co.	118
Armstrong Mfg. Co.	46	Canfield, H. O.	40	Dixon, Jos., Crucible Co.	72	Hazard Mfg. Co.	6
Arnold Metal Wheel Co.	95	Canton Saw Co.	70	Dodd, A. W. & Co.	125	Heinisch's R. Sons Co.	73
Artificial Gas Engineering Co.	28	Capewell Horse Nail Co.	108	Donaldson Iron Co.	27	Henderer, A. L.	41
Ashcroft Mfg. Co.	35	Capital Machine Tool Co.	66	Doscher, Martin	73	Henderson Bros.	26
Athol Machine Co.	67	Carbon Steel Co.	21	Douglas, W. & B.	66	Hendey Machine Co.	62
Atlas Mfg. Co.	103	Carlin's Sons, Thomas	58	Draper Machine Tool Co.	58	Hendricks Bros.	2
Atlas Tack Corporation	10	Carpenter, J. M. Tap & Die Co.	125	Dudgeon, Richard	45	Hendrick Mfg. Co., Ltd.	7
Babcock & Wilcox Co.	37	Carroll Muzzle Co.	116	Dunlap, C. W.	95	Hendryx, A. B. Co.	3
Raeder, Adamson & Co.	64	Cary Mfg. Co.	81	Dunbar Bros.	5	Henley, M. C.	85 & 115
Banker & White	71	Central Iron & Steel Co.	21	Dunham Nut Machine Co.	61	Henry Mfg. Co., J. T.	77
Bardsley, J.	101	Chadborne & Coldwell Mfg. Co.	115	Dupont Mfg. Co.	41	Herrick & Cowell	61
Barns, C. K. & Co.	22	Challenge Corn Planter Co.	93	Durant, W. N.	54	Herrick, F. A. & Co.	79
Barnes, W. F. & John	43	Chambers Bros. Co.	118	Dwight Slate Machine Co.	46	Herrick, J. A.	29
Barnett, G. & H.	7	Champion Blower & Forge Co.	48	Eagle Anvil Works	70	Hertz, T. & Son	4
Barnum, E. T.	61	Champion Iron Co.	7	Eagle Bicycle Mfg. Co.	125	Higginan Hdw. Co.	38
Bass Foundry & Machine Works	36	Champion Mfg. Co.	116	Eastern Forge Co.	15	Hillebrand & Wolf	41
Bay State Stamping Co.	54	Chandler & Taylor Co.	35	Eccles, Richard	103	Hill, Clarke & Co.	67
Belden Machine Co.	63	Chapman Valve Mfg. Co.	33	Eddy Electric Mfg. Co.	32	Hobson, F., Seaman & Co.	19
Bell, Geo. E.	54	Chatillon, John & Sons	91	Edge Moor Iron Co.	27	Hoefig, C. W.	71
Bellevue Pump Co.	67	Cheney, S. & Son	24	Eicken & Co.	20	Hoffman, C. & A.	72
Bement, Miles & Co.	44	Chess Bros.	24	Electric Cutlery Co.	74	Hoffman, J. W. & Co.	18
Bemis & Call Hardware & Tool Co.	104	Chester Steel Casting Co.	26	Ellwood Shafting & Tube Co.	18	Hogan, John L. & Co.	18
Benbow Mfg. Co.	96	Chicago Spring Butt Co.	101	Empire Portable Forge Co.	110	Hoggson & Pettis Mfg. Co.	48
Berger Bros.	91	Christy Knife Co.	75	Enterprise Mfg. Co. of Pa.	95	Hollands Mfg. Co.	67
Berlin Iron Bridge Co.	9	Chrome Steel Works	25	Erie Engine Works	35	Holmes & Edwards Silver Co.	77
Bertsch & Co.	42	Church, Isaac	118	Estey, W. S.	6	Holt, Hiram & Co.	104
Best, Fox & Co.	3	Cincinnati Corrugating Co.	10	Ette & Henger Mfg. Co.	114	Houston, C. B. & Co.	18
Bethlehem Iron Co.	22	Cincinnati Mfg. Co.	97	Etting, Edw. J.	18	Howard Iron Works	65
Bevin Bros. Mfg. Co.	85	Cincinnati Milling Mch. Co.	61	Eureka Cast Steel Co.	126	Howard & Morse	7
Bickford Drill & Tool Co.	51	Claflin Mfg. Co.	40	Evans-Friction Cone Co.	3	Howson & Howson	6
Bicycle Step Ladder Co.	90	Clancy, J. R.	61	F. & N. Mfg. Co.	117	Huyett & Smith Mfg. Co.	51
Bigelow, C. R.	67	Clapp, Geo. M.	57	Fairmount Machine Co.	53	Ideal Machine Works	61
Bigual & Keeler Mfg. Co.	44	Clark, G. P.	116	Fay, J. A. & Egan Co.	52	Ideal Mfg. Co.	35
Billings & Spencer Co.	104	Clark & Cowles	68 & 33	Fearing, Wm. S.	2	Illinois Central R. R.	59
Bingham, W. Co.	74	Clarke, Thomas	94	Ferracute Machine Co.	42	Illinois Pure Aluminum Co.	90
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Bissell, E. Son & Co.	54	Clement & Dunbar	65	Fitch, W. & E. T.	125	Ives, H. B. & Co.	105
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Bliss Co., E. W.	41	Cleveland City Forge & Iron Co.	1	Flag, Stanley G. & Co.	126	Jeffrey Mfg. Co.	39
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Bond Nail Co.	14	Cleveland Twist Drill Co.	50	Frankford Steel Co.	20	Jessop, Wm. & Sons	19
Boone, W. C. Mfg. Co.	26	Clinton Wire Cloth Co.	8	Franklin, H. H. Mfg. Co.	58	Johns, H. W. Mfg. Co.	16
Booth, The Lloyd Co.	27	Cobb & Drew	14	Frasse Co.	65	Johnson, I. H., Jr., & Co.	52
Borden & Lovell	7	Coburn Trolley Track Mfg. Co.	98	Fray, Jno. S. & Co.	77	Jones, B. M. & Co.	22
Borgner, Cyrus	27	Cockburn Barrow & Machine Co.	114	Frost Thill Spring Co.	109	Jones & Lamson Machine Co.	62
Boston Bridge Works	16	Coes, Loring & Co.	110	Fulton Iron & Engine Works	52	Jones, Jesse & Co.	75
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Lufkin Rule Co.....	90	Ossawan Mills Co.....	125	Scoville Mfg. Co.....	2	Valley Steel Co.....	1
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Lunkenheimer Co.....	36	Otto Gas Engine Works.....	31	Seaman, Sleeth & Black.....	24	Van Wagoner & Williams Co.....	126
McCabe, J. J.....	56	Oxford Iron & Nail Co.....	14	Sellers, Wm. & Co.....	53	Victor Mfg. Co.....	103
McCaffrey File Co.....	71	Packer, C. W.....	63	Seneca Falls Mfg. Co.....	51 & 68	Vulcan Iron Works.....	24
McClure, Amsler & Co.....	29	Palmer, De Mooy.....	26	Sessions Foundry Co.....	26	Wals & Roos Punch & Shear Co.....	61
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Maslin, J. & Son.....	38	Pike Mfg. Co.....	87	Spedel, J. G.....	53	Wickwire Bros.....	7
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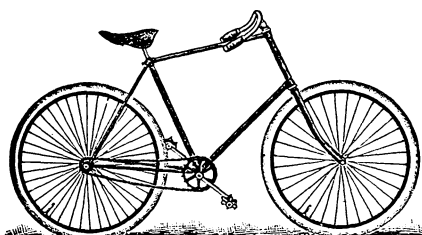
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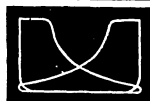
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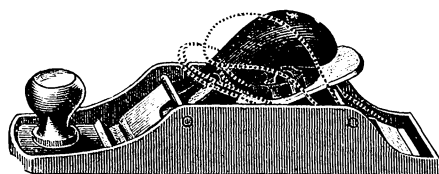
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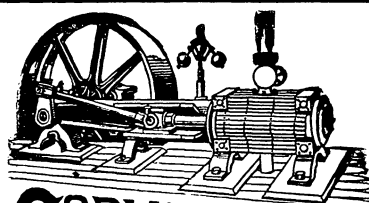
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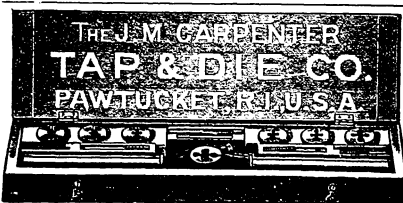
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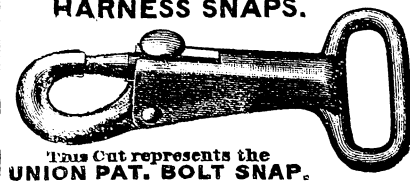
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THE IRON AGE

THURSDAY, FEBRUARY 1, 1894.

The American Automatic Cut Off Engine.

We present on this and the following pages illustrations and descriptions of a high grade automatic engine, built by the American Engine Company of 55 Raritan avenue, Bound Brook, N. J., a company organized in 1893 with a capital of \$200,000. This company bought from the American High Speed Engine Company their fine plant, and adopted the name of the American Engine Company.

The claims made by the manufacturers are as follows: This engine pos-

sesses the remarkable features of retaining all the simplicity of the single valve engine while distributing the steam as in the Corliss and other complicated engines which give the highest attainable steam economy. Simplicity is always desirable in machinery, but is often sacrificed for complication to secure better results. Heretofore the consumer of steam power has had to choose between two evils, viz.: the evil of complication for good steam economy, or the evil of poor steam economy for simplicity. We leave our readers to judge of the merits of the above claims.

and is produced by the eccentric shown as it revolves around the shaft, the motion being transmitted to the valve by means of the eccentric rod and valve rod. So far this description would apply to many of the numerous piston valves and operating mechanisms.

The peculiarities are.

1. The eccentric is fixed to the shaft, which makes the reciprocations of the valve invariable, thereby giving a constant admission, constant release, and constant compression.

2. The automatically variable cut off is produced as follows: In addition to the annular ports this valve is provided with longitudinal ports, and corresponding ports are cast in the stationary sleeve, which is within the steam chest, as shown in Fig. 4. As the inner ends of the valve are closed, the steam, in order to get into the cylinder, must

pass through these longitudinal ports, and will so pass when the ports in the valve coincide with the ports in the stationary sleeve; and the flow of steam to the cylinder will be cut off when these ports do not coincide. Therefore the admission of steam to, and the cut off from, the cylinder depend upon the longitudinal ports in the valve being brought into communication with the ports in the stationary sleeve, and *vice versa*. This opening and closing of these longitudinal ports calls for a twisting motion to be imparted to the valve. This is accomplished by the eccentric sleeve, mounted upon the eccentric, Figs. 1 and 2, having a di-

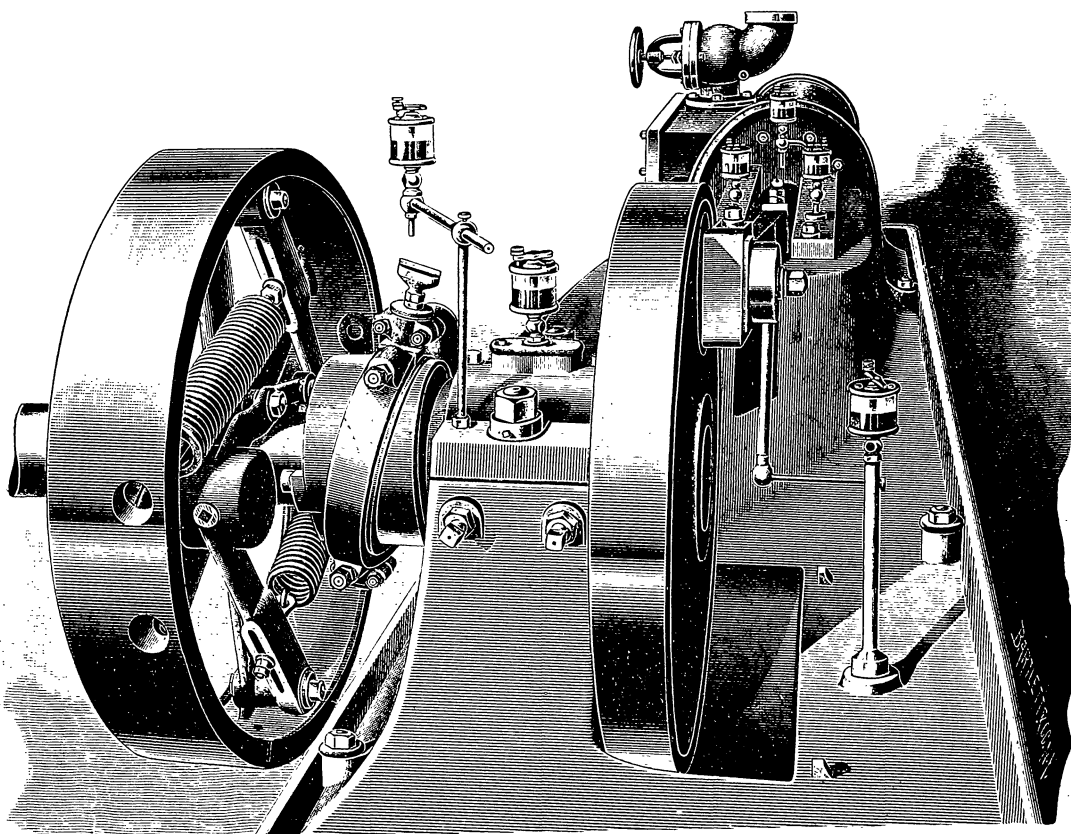


Fig. 1.—End View.

THE AMERICAN AUTOMATIC CUT OFF ENGINE.

agonal V-shaped groove turned in its periphery, to which is fitted the eccentric strap. This sleeve is connected with the governor weights by links in the usual way of connecting eccentrics. As the sleeve revolves with the eccentric, being carried around by the governor weights, a twisting motion is imparted to the eccentric strap and through the eccentric rod and valve rod to the valve.

It will therefore be seen that the valve has two motions, one an invariable reciprocating motion, the other a twisting motion, which is invariable in degree, but variable relative to the reciprocating motion. This variation is accomplished by the rolling of the sleeve on the eccentric whenever the governor weights change their position as a result of a change in speed.

The experience of this company with

piston valves condemn their use in a horizontal position. For notwithstanding they are perfectly balanced against steam, their weight produces friction, which causes wear, and soon results in leakage. But they will use them in their vertical compound and triple expansion engines, in which their weight will be supported by the valve stem in a vertical position, doing away with friction and consequent wear.

surrounding it; and the cutting off of the steam is accomplished by twisting or rotating the valve, which opens and closes the longitudinal ports. No change whatever is required in the valve gear to actuate this valve.

The exhaust steam passes directly to an exhaust pipe cast on the under side of the steam chest, the ends only being joined to the steam chest, so that the exhaust does not come into contact with

valve seat proper by a pin, but are free to move out of the groove in the valve (as wear may occur) against their bearing surfaces.

The economy of small clearance space is fully realized in this engine, having but one short port at each end of the cylinder for the admission and education of steam.

The indicator cards shown in Fig. 6 are from an engine equipped with the

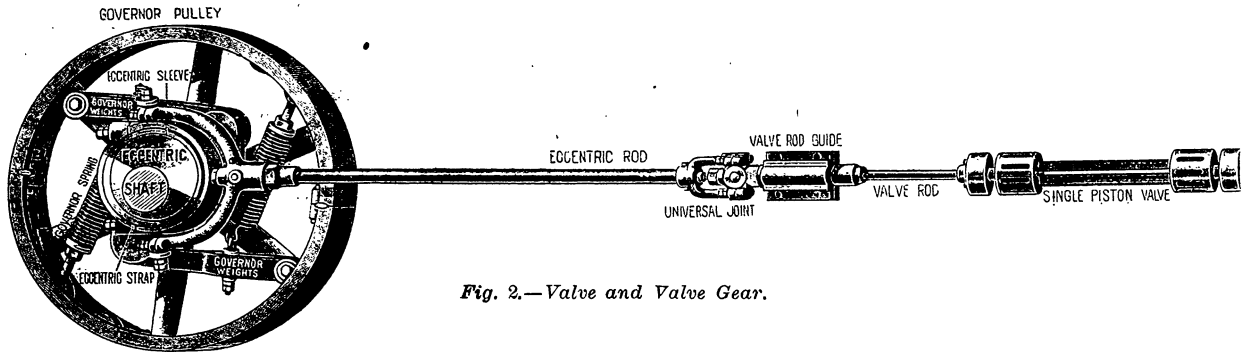


Fig. 2.—Valve and Valve Gear.

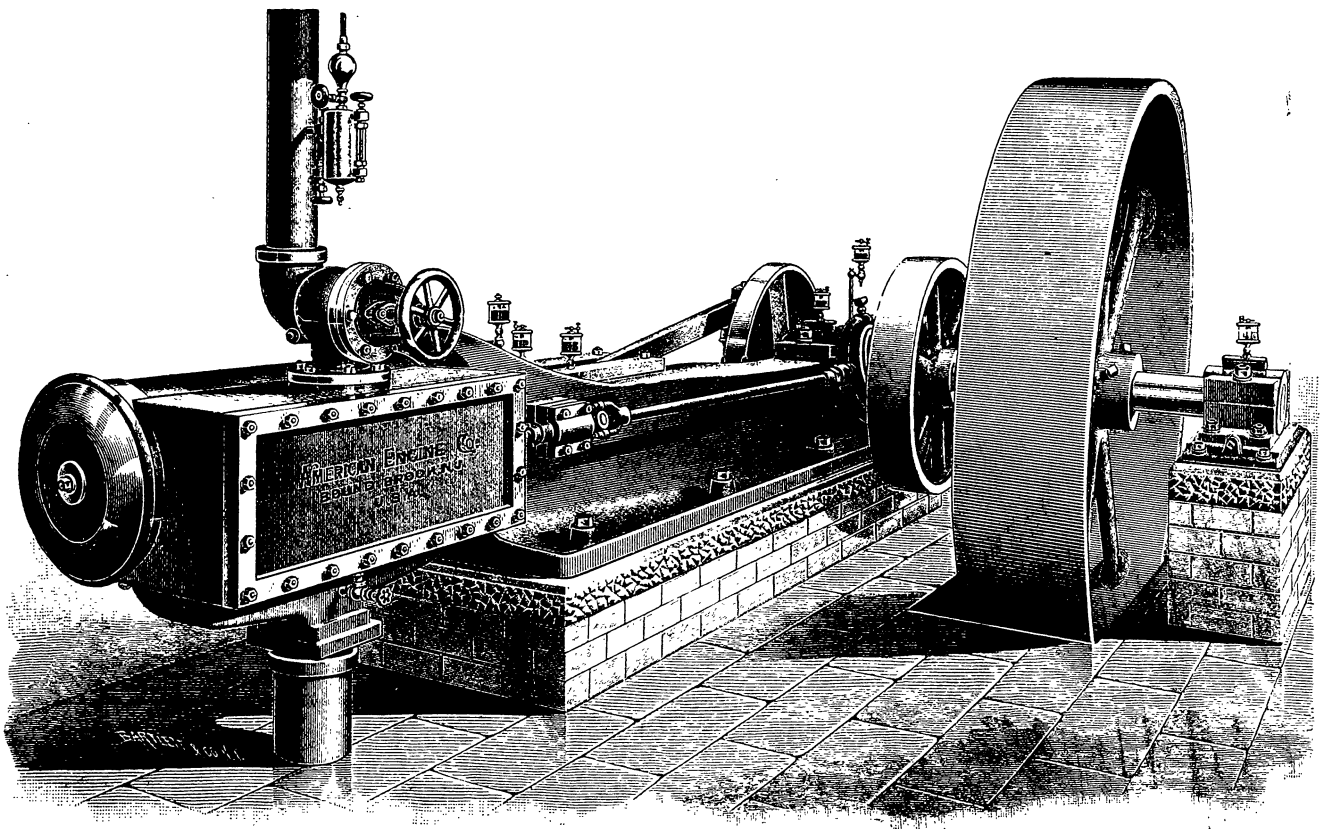


Fig. 3.

THE AMERICAN AUTOMATIC CUT OFF ENGINE.

Fig. 5 is a horizontal section through cylinder and illustrates the construction of the valve used in the horizontal engines. It consists of a flat face slide valve bearing upon a flat seat, against which it is held by the steam pressure. The valve travel is invariable, hence the wear upon its seat is uniform, and therefore the valve always remains tight. This valve controls the admission, release and compression, maintaining them constant; while the cut off is variably controlled by a small cylinder valve within the slide valve, as shown. This valve is provided with longitudinal ports, and corresponding ports are cast through the shell of the slide valve

any live steam surfaces except the ends of the main valve. The live steam is conveyed by a pipe into the steam chest through the top at the center, and is prevented from passing into the ends of the valve to the exhaust by packing strips, one bearing against the steam chest cover, the other against the top of the steam chest, being kept in contact with these surfaces by the steam or by small springs when the steam is turned off. A corner piece is so constructed as to effectually close the joint where the packing strips meet at the corner. These strips are made of the same material as the valve, and are secured from moving away from the

valve shown in Fig. 5. The engine is 13 x 24, and is run at a speed of 150 revolutions. They show that the valve, even under wide variations of load, gives a constant admission, constant release and constant compression

A serious calamity has befallen Purdue University, at Lafayette, Ind. On the 23d ult. the new Heavilin shops, the mechanical department of the university, built and equipped at a cost of \$180,000, were totally destroyed by a fire which broke out in the boiler room, caused by an explosion of natural gas. The buildings were located in West

Lafayette, which is without water works, and although the Lafayette department responded promptly the fire men were compelled to watch the shop burn to the ground. The Heavilin shops were dedicated on the previous Friday with appropriate services. The building was a two story brick and

map of that railway, the Minneapolis, St. Paul & Sault Ste Marie and the Duluth, South Shore & Atlantic, with their connections. The map covers the whole of the provinces from ocean to ocean, as well as the Northern part of this country, and is claimed to be geographically accurate. Every station

sidewalk for this purpose, rather than the building of the usual structure for the passage of heavy trains, that they will shortly build an experimental loop to exemplify the advantages and conveniences of this method of picking up and discharging passengers. The moving sidewalk will be elevated on col-

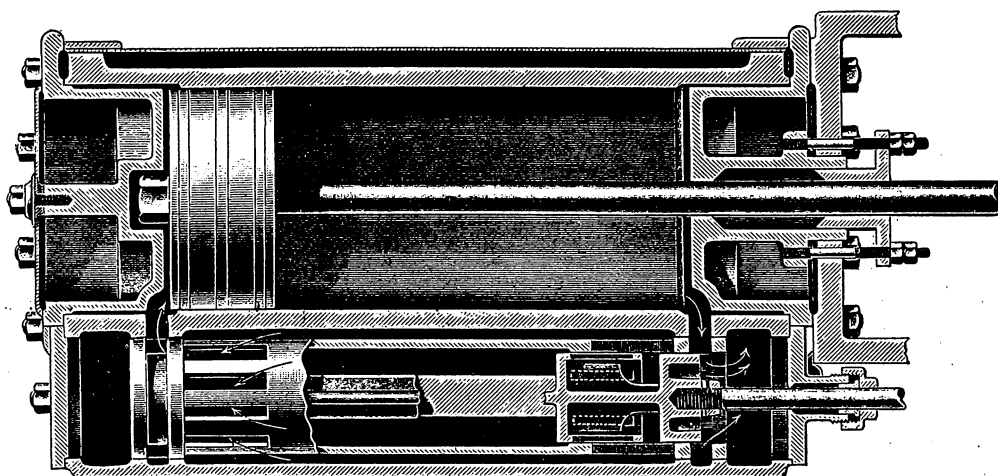


Fig. 4.—Piston Valve for Vertical Engines.

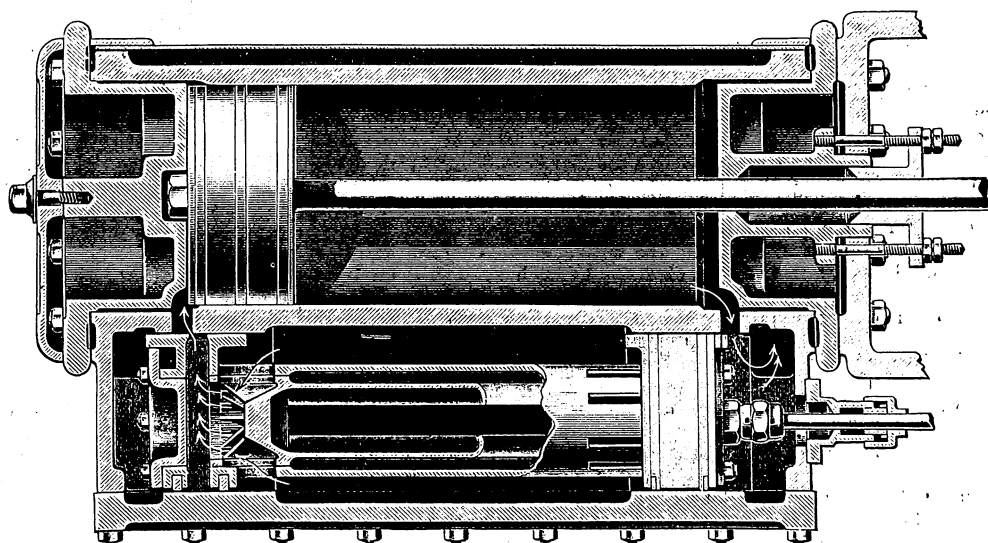


Fig. 5.—Valve for Horizontal Engines.

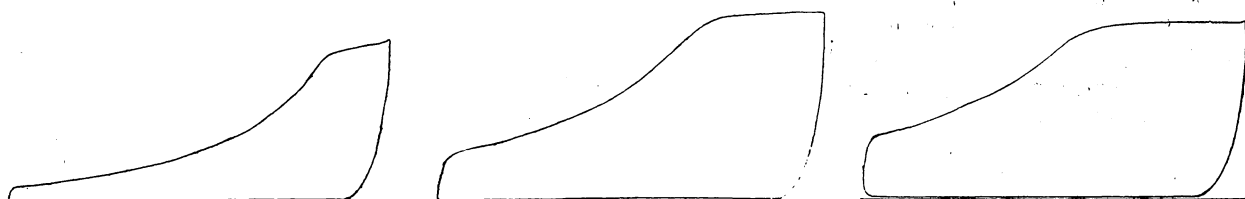


Fig. 6.—Indicator Cards from Valve Shown in Fig. 5.

THE AMERICAN AUTOMATIC CUT OFF ENGINE.

stone structure, with one story wings on either side, was 400 feet long, having a tower 140 feet high, and covered an area of $1\frac{1}{2}$ acres. Amos Heavilin of Frankfort, now deceased, contributed \$35,000 to its erection and the State and National Governments completed the building. A few of the machines and furnishings were saved. The building and contents were well insured.

The Canadian Pacific Railway Company have issued an unusually fine wall

on the Canadian Pacific system is shown, as well as steamship routes on the Atlantic and Pacific.

Chicago proposes to make a practical test of the moving sidewalk, which will be remembered as one of the novel features of the late World's Fair. The Central Construction Company, having in charge the building of a loop through the business center as an extension of and feeder to the South Side Elevated, are so strongly in favor of a moving

umns built at the curb lines of the regular sidewalks. The passenger steps on a platform moving at two miles an hour, thence to another moving at four miles, and thence to another at six miles, where he seats himself under cover. The motion is continuous and has been found by the long trial at the World's Fair to be almost wholly without danger, even to small children. The scheme meets with so much favor that numerous property holders on the proposed route have already signed permission for its construction.

The Western Foundrymen's Association.

The regular meeting of the Western Foundrymen's Association was held on Wednesday evening, January 24, at the rooms of the Detroit Foundry Equipment Company, 225 Dearborn street, Chicago, with the president, George M. Sargent, in the chair and B. M. Gardner secretary.

The following made applications for membership and were unanimously elected as members of the association: Dickman & Mackenzie, 1224 Rookery Building, Chicago; W. H. Fenner, Jr., 147 Van Buren street, Chicago. W. D. Sargent of Chicago presented the following resolution to be acted upon at the next regular meeting:

Resolved, That Article I of the by-laws shall be amended to read as follows: The regular monthly meeting of the association shall be held on the third Wednesday of each month, at the rooms of the association, at 2 o'clock, p. m.

C. K. Pittman of Chicago then read the paper of the evening, entitled

"Coke."

In the year 1849, Overman, in his book "The Manufacture of Iron," said: "As there is but little prospect of an addition to the number of coke furnaces which now exist we shall devote but a limited space to this subject." The value of coke produced at that time was about \$15,000. In 1891 the output was about 10,350,000 tons, with a valuation of over \$20,000,000. This marvelous development is due to the superiority over other fuels for iron working. There are other fuels that are better than coke for some specific purposes, but no other unites to so great an extent the qualities needed in the reduction of ores and the melting of iron, and I may add for domestic purposes.

The coal deposits from which is made the coke we use here are found in the States of Pennsylvania, West Virginia, Virginia, Kentucky and Alabama. The latter produces about 13 per cent. of the total output, but its use is confined wholly to the South. In the far West the Colorado field, as far as now known, is the most important. Her smelting and iron works are supplied wholly from her own ovens, and while this coke is not equal to that of the East, there are still undeveloped deposits of coking coals that will before long furnish a fuel of the best grade.

The coke that comes to this market is produced in the three States first mentioned, and in a general way may be classified as the Connellsville from Pennsylvania, coke from the Fairmont region of Northern West Virginia, New River and Kanawaha cokes from the central and western part of the same State, and the Pocahontas coke from the southern parts of Virginia and West Virginia. There are many other cokes not included in this general classification. The area of the coal deposits from which these cokes are made is so extended that there is a wide diversity in quality and characteristics. They range from the bad to the excellent, and it requires considerable knowledge and experience to pass upon their merits.

It is surprising to find how limited is the knowledge of coke, not only among people in general, but even among those who from the nature of their business should be informed. It is more curious that so few of those who manufacture

coke have an intelligent understanding of the product of their ovens.

The history of the production of iron and steel shows a wonderful development, preceded and attended by careful and scientific investigations. In the manufacture of coke we are using essentially the same methods that were used at the beginning of the industry. Little effort has been made to lessen the enormous waste of fuel or to discover the means of making the product more uniform and effective. Within a very few years there has been a movement in this direction, and though comparatively little has been accomplished there has been a decided gain. Generally speaking, European practice is in advance of ours.

To what extent the quality of coke can be improved is a question. My own belief is that it can be greatly benefited by better methods. So long as we have an unlimited supply of coking coal the need of better methods of manufacture will not force itself upon us. The production of some of the very best coke regions has already begun to diminish. The needs of the iron trade forced the use of low grade ores that had been esteemed wholly useless. The same condition of affairs will affect the coke industry. Coals that now produce inferior coke must revolutionize their process, and competition will oblige the purer coal to follow in a measure the same course. We have already come to recognize one fact, and that is that the same methods will not apply to all coals. Variety of coal requires variety of coking if uniform results are to come. In one of the coke regions referred to above a number of the operators made so poor a coke that their sales dwindled to the starvation point. Instead of giving up the battle they called to their aid the help of the chemist and the engineer. They changed their methods radically, and to-day an increased output and larger sales with much more satisfactory returns are the result.

The mechanical process of making coke as now in use is too well known to need more than passing mention. This fuel is obtained by the expulsion of the volatile constituents of coking coal and a portion of the impurities through the action of heat, leaving behind all of the fixed carbon and sometimes more, together with the earthy constituents, as an ash. It is rather distillation than combustion. The quality of the coke depends primarily upon the character of the coal and upon the skill and judgment of the coker. Under the present methods a good coal can turn out a poor coke, but a poor coal can hardly produce a good coke.

The burning continues for 48 hours for furnace and 72 hours for foundry coke. For foundry use it is generally thought necessary to have the 72-hour coke. I do not think this belief is well founded. Furnace coke for general use gives as good results in the cupola as the foundry coke. For special purposes the harder coke may be needed.

The objection to the black ends is largely a prejudice. To test this the manager of a large iron foundry had three cars of black ends coke sent to the works. The foreman promptly reported the arrival of the bad coke. To his astonishment he was instructed to accept and use it. Puzzled and unwilling, he did so. The black ends were used and the results were the same as with gray coke.

All coals contain more or less sulphur, and many phosphorus. To reduce these two substances to the minimum is a constant labor. The sulphur

occurs to a greater extent than phosphorus, and its elimination is one of the problems of coke making. We may say that the amount of phosphorus is so small in the better class of cokes that they need not be considered. That sulphur is a deadly enemy of iron nearly all foundrymen are agreed, yet some good authorities claim that in a general way a certain proportion of sulphur improves the iron, making it stronger and more fluid without weakening it. How far this is true is very uncertain.

The ideal coke for foundry use is one that has the greatest amount of fixed carbon, a cellular structure that is strong enough to carry the burden and produce the most perfect combustion, has no ash in excess of what is needed to insure the most efficient work, and is free from those substances that will change the character of the metal and weaken it.

Our knowledge of the chemical changes that coal undergoes when converted into coke is meager, and until they are known we cannot produce that best fuel that we are seeking. Yet many of our cokes approximate to it. The necessity for scientific methods based upon accurate knowledge is becoming more apparent. The importance of correct analysis of fuel is recognized. Every step in blast furnace practice is based upon the analysis of the chemist. A similar course is of advantage to the foundrymen, modified by the different conditions, but it must be joined to good judgment and experience.

It has been said that figures will not lie, but the figures of a coke analysis do frequently deceive, partly because the analysis may not be correct and partly because we may only imperfectly understand what it says. The analysis of coke is too often deceptive, because the sample is not properly selected and is not an average of the fuel. Therefore it may show the coke to be poorer than it is or better than it is. Probably the latter is more often the case. The method of the analysis may be wholly correct but the theoretical conditions under which it is made may not show what it can do in the foundry unless we know enough to read between the lines. The analysis that gives the total amount of ash on a coke is not always sufficient. The constituents of the ash are as often as necessary, since they may be of such character as to produce a change in the molten iron and may have more or less bearing upon the flux that should be used. There is from time to time some variation in the same coke that results from the varying conditions attending the burning, and some variation in the coal. What all these small variations are that produce this effect we do not fully know. It results from this that more than a single analysis is desirable.

The cokes that come to this market and to the West generally show a wide diversity in the analysis. This may be the case and yet all the cokes may be good in their proper places. They contain from 87 per cent. to 92 per cent. of fixed carbon, from 6 per cent. to 12 per cent. of ash, and sometimes as high as 17 per cent., and from 0.6 per cent. to 1.25 per cent. of sulphur.

For foundry use the higher the percentage the better, provided it does not contain too much sulphur. The amount of sulphur that can be safely used seems to be uncertain, or rather opinions and results vary. The general belief seems to be that 1 per cent. is the maximum, but I have heard men of much experience say that 1.25 per

cent. is the limit. The cokes most generally used here contain from 0.75 per cent. to 1 per cent.

The proper amount of ash is an unsettled question and the belief seems to be gaining that while too much ash clogs the work it is as bad to have too low an amount as too great. The constituents of the ash are undoubtedly a factor to the question. With our limited knowledge we may say that probably there should be a suitable balance of proportion of all constituents of coke, and we know that the character of the iron and the flux are factors in the problem. We do not understand very fully the cellular structure of the coke. Upon it, however, depends the strength and also the perfectness of combustion. Whether it can be varied and what amount is best, is, I think, an unsolved question. A gentleman of much experience claims that he can vary the structure of the coke at pleasure. It certainly is modified by the preparation of the coal—the more finely divided the coal the more dense the coke. It is also influenced by the amount of volatile matter in the coal or by the amount of free hydrogen.

It is evident that there is a wide field for research in the coke industry. It is gratifying to see that the belief that any coking coal, a bee hive oven, and the application of heat must turn out a salable coke is weakened of late. It is but just to say that there have been some notable exceptions among coke manufacturers. The average of coke to-day is certainly higher than it was a few years ago, but this does not mean that there is no need of greater and better results. The average of American cokes is higher than the average of European cokes, though the best of the English coke is probably more effective than our best. The richness and extent of our coal fields, the comparatively good fuel that comes from our ovens with the minimum of trouble and expense, has withheld the incentive for improvement that exists in so many other industries.

From one point of view the use of coke in foundries is a small question, but when we consider the great variety of ores and iron, the same variety, in fuel, the limited knowledge we have of the chemical and physical changes that are brought about in the cupola, and the interdependence of all steps leading up to the finished castings, the subject becomes a larger and complex one.

In the operation of a blast furnace and in the whole process from the mining of the ore to the casting of the pig and the finished steel practical skill goes hand in hand with theoretical knowledge. The judgment of the worker is supplemented by the training of the student. I see no reason why in foundry practice the same conditions do not exist. Every experienced foundryman is a better workman when he adds to his practical training theoretical knowledge. This scientific training is but the practical knowledge of those who have gone before us classified, sifted and preserved for those who may use it. The foundryman who unites his personal experience with the experience of others, obtained by personal contact, within the walls of technical schools or from the pages of the book, will use his material most economically, will make the fewest failures, will secure the most uniform results; in short, will do the best work.

A somewhat extended experience has shown that it is a lack of accurate knowledge in much of the foundry work that is responsible for many expensive failures such as come so often,

rather than inferior materials to which it is so often charged. There seems to be in this industry what has been so often, and I may say generally, found in all industries—a tendency to get into a rut. With reference to coke, there have been many amusing and many annoying illustrations of this fact. A few years ago because of a strike the coke produced at certain ovens could not be had, and new and untried cokes must be used. This new coke was used by three different foundries not far from here, all doing the same kind of work, under apparently similar conditions. One foundry reported the coke entirely satisfactory and continued its use. Another declared the fuel a total failure; that the iron was white and the castings inferior. The third foundry, located not more than 200 yards from the second, confirmed the experience of the first, and has continued to use the coke. Similar instances different in details but involving the same principle could be cited at length. What is the explanation? It would seem to be that there is a want of method, an absence of knowledge outside of the groove in which the work has been running. So long as the work is done in the customary way the results may be satisfactory, but if any of the conditions are changed the whole system is out of joint.

Another instance is a type of many. In a large foundry this test was made: A new coke was bought and put in for use. The foundryman objected to any change, and the new coke, though one of the standard brands, was pronounced unsatisfactory in most respects. Then the same coke was sent down under the name of the coke that had previously been used. Then everything went smoothly, and the coke was what was wanted. In both cases the coke was identical, as were all the other conditions.

From the time the ore is taken from the mine until the finished casting or forging leaves the shop, iron and coke are most closely connected. The former has been evolved by the application of all the chemical resources of science. The expansion of the iron in industries has brought into use a great variety of ores and many grades of iron. To so great an extent is this true that a new grading of iron, based upon a chemical analysis, is urged. This fact brings out a point in the use of coke. From time to time complaint is made that coke is high in sulphur, making the iron white, hard and weak. In many cases the complaint may be just, but I am certain that in many others the coke is guiltless. The analysis of iron is fully as important as that of coke. A few years ago one of our large Western foundries reported that the coke sent to them was bad, and that it could not be used. An investigation made it clear that the castings were bad, white and chilled. The same coke was in use at an equally large foundry at some distance from there. This foundry, while placing a just estimate upon the practical skill, had made it a rule that everything that went into the cupola must be analyzed and a record kept. This record showed that the coke had been all right, showing only the usual average of sulphur. Inquiry developed the fact that at the foundry making the complaint no such system of analysis was in use. The inquiry carried still further made it quite certain, to me at least, that the whole trouble was in the iron, though the coke bore the blame. Your own experience will probably furnish similar cases; sometimes it is silicon in the

iron, sometimes it is sulphur in the pig, sometimes phosphorus and sometimes it may be the flux, but coke is too often the vicarious sufferer.

The heart of the foundry may be said to be in the cupola. Most of the troubles that come originate there. There is no part of foundry work that demands such close and intelligent care. If the cupola is not in proper condition or not adapted for the work, if the iron is not of proper grade, if the coke is too light or too impure, if the flux is unsuitable, if the blast is too intense or too weak, if the supply of air is too great or too small, the effect will be seen in the finished casting. The overlooking of one small point may spoil the whole work.

To lay down a rule or set of rules for the use of coke in a cupola is not possible. The efficiency of the furnace depends upon the proper adjustment of the parts and the accurate working of all to one end. It is necessary to be personally acquainted with the cupola and the blast furnace. A man who was practically and theoretically familiar with a certain blast furnace once said, when many miles distant from it: "If you will tell me the condition of the atmosphere, the strength and direction of the wind at the furnace to-day, I will tell you what grade of iron is being produced." This claim was in a large measure justified by test. The chemical reactions that take place in the cupola are imperfectly understood. We know enough, however, to appreciate the importance of a full knowledge of the constituents of iron and coke, and it may be added there should be a similar knowledge of the flux that is used. Only by such knowledge can the proper kinds and proper proportions be known. The use of an improper flux and even an excess of a suitable one may produce the same effect that excess of sulphur in coke or iron does. To what extent iron will absorb sulphur from the fuel is not known, but when the coke contains 1.5 per cent. and probably 1.25 per cent., the iron will be deteriorated. It is probable that a better understanding of the reactions of iron, coke and flux will make it possible to use without injury a coke higher in sulphur than is now thought possible. Some recent experiments have been made in this direction, but nothing definite has been reached. Apparent progress has been made, however, in methods for the elimination of sulphur from the molten iron, which may have a bearing upon our problem. Another factor in cupola work that most closely affects coke is the blast. It has been clearly demonstrated that the use of hot blast saves fuel, but the working of most foundry furnaces is so intermittent that its use is hardly feasible. It has seemed that too many foundrymen fail to appreciate the real necessity of the proper adjustment of the air supply that enables the coke to do its work. The pressure of the blast should be sufficient and the amount neither too great nor too small. There is a waste of both coke and iron in either case. If the pressure and amount of air are not enough the melting will be retarded, the fuel will be consumed, but will act too slowly, the metal is deteriorated, runs thick and the castings are inferior. If the blast is too strong the coke is consumed too rapidly, and a portion blown out unconsumed. The intensity of the heat beyond what is needed hardens the iron, is apt to induce chemical action between iron and the impurities of flux and coke and cause the thin liquid slags to attack the lining. Thus the

full value of the coke is utilized only with the proper intensity amount and uniformity of blast. The blast moreover must be regulated by the character of the iron, of the coke and the flux. If the coke used is hard and firm the blast should be stronger than if a lighter and more porous coke be used. Many a good coke has failed because the blast was not properly regulated.

It is an error to suppose that sulphur can be burned out by intensity of heat. The analysis of gases escaping from blast furnace chimneys shows no sulphurous vapors, and I think none containing phosphorus. Upon the same principle, in burning coke about one-half of the sulphur of the coal is driven off if the heat is regular and not too intense. If it be too intense the sulphur seems to have chemical affinities developed that cause it to enter into combinations upon which the heat has no effect.

It will naturally result from what has been said that from inattention to details there must be a large waste of coke in cupola work. The loss through breakage in transit and careless handling is small compared with that due to faulty methods. In England the average consumption of coke in cupola work is 280 pounds with a minimum of 175 pounds per ton of iron melted. In this country the best practice puts the minimum between 150 pounds and 225 pounds, though this is perhaps too small. What the average is I cannot say. In what has been said in a general and rather desultory way, the object has been not to criticise, but to call attention to those more obvious points in foundry practice that may be improved, as they appear to a layman. The use of coke is so intimately bound up with all other materials that enter the cupola, and one so depends upon the others that no rule of action can be formulated for one that does not apply to others. Considering coke alone we can say that so far as we now know it is the best fuel for the melting of iron in the cupola, because it is, as a rule, more pure and uniform, and, when properly used, will give the maximum of efficiency. When we ask what the best coke is we can hardly answer in a word. We must take into account the kind of work to be done, the iron to be used, the flux that is best adapted and the conditions of the blast. We must know in a measure what our iron contains, what are the constituents of flux and coke. We should know as much as we can of the chemical affinities and relations of these constituents. Then we can say with some degree of accuracy whether Connellsville or Pocahontas is best, whether New River or West Virginia will be most efficient and economical.

Discussion.

J. N. Barr: I would like to ask one question: On what grounds does Mr. Pittman claim that coke is better fuel than anthracite coal for cupola work?

Mr. Pittman: I do not know that I can answer that question, partly because I am familiar with the use of anthracite coal to a very limited extent; but I think it is essentially true that the best grade of coke is better than the average grade of anthracite coal. I believe that coke is more easily regulated than anthracite and more uniform in its qualities. I might also add that the difference in the nature of the two fuels, when they are properly treated, will insure more perfect combustion in the coke than in the anthracite coal.

Mr. Barr: I have had a very large experience with both, and as a result of

that experience, without going into details, I would say that with fine grade work anthracite coal will make better, softer and finer castings. That is, the castings are softer and the iron more fluid, and it retains its fluidity longer in the ladle with coal than with coke. But in this Western country the difference in the cost in using coal and coke is so great that I do not know that it would pay to use anthracite coal, except for special purposes.

Mr. Pittman: To what do you attribute this difference?

Mr. Barr: I scarcely know. The anthracite I was accustomed to use was freer from sulphur. Coke is more open, the blast passes through more easily and it will melt the iron more rapidly and make an iron which will chill more quickly, passing from the limpid condition that is proper for fine castings into a condition approaching mushiness. There is no doubt that that is true. Whether it is due to a greater amount of sulphur I do not know. At the same time anthracite coal will require twice as much blast pressure to melt the iron as coke and the iron will not run out as fast. Our practice out here is to mix anthracite coal and coke, half and half. The coke keeps the bed of coal open. I think we get a less amount of sulphur and less deterioration of the molten iron than in using coke alone.

Mr. Pittman: Do you mix the coke and anthracite throughout the entire charge?

Mr. Barr: Yes, sir.

G. M. Sargent: What is the anthracite you use, Mr. Barr?

Mr. Barr: The anthracite we have been using is the Cross Creek coal. We have used that, and we have also used the Honey Brook and the Pardee coal.

J. H. Whiting: Did you ever have these coals analyzed?

Mr. Barr: No, sir. Mr. Pittman spoke of the raw ends of coke. I made an experiment with that with a little cupola I had. I broke a lot of pigs and put one-half in one pile and one half in another so that one-half of each pig was used in each experiment. I then sorted out a lot of the clearest, densest coke and a lot of the black ends and melted the two lots of iron in as nearly similar circumstances as possible and took chill tests of the resulting mixtures. The result was, as nearly as I can recollect, that the iron melted with the clear coke chilled $\frac{1}{2}$ inch and that melted with the black ends chilled pretty nearly $\frac{1}{2}$ inch.

Mr. Whiting: How many experiments did you make?

Mr. Barr: Two.

Mr. Pittman: I would like to say that the cases to which I referred were not carried on to any great extent. I observed in one place where they had kept the analyses of coke that black ends gave the better analysis. I was surprised at it. I have been very much interested in the question. I am inclined to think there is a prejudice against the black ends.

Mr. Barr: There is this to be taken into consideration in the matter of results in every foundry: Here is a foundry working with a mixture of metal that has as much sulphur in it as it will stand. If they use a coke with a large amount of sulphur in it, that is the last straw that breaks the camel's back. At the same time, a foundry using a lot of iron that is lower in sulphur and probably high in phosphorus can use coke which introduces an increase of sulphur and not notice any effect whatever. It seems to me that two foundrymen can get contrary results of that kind and be perfectly correct in the positions

they take. The results are really not contrary.

Mr. Whiting: Do you not think that that comes largely from the coke not being uniform? A great many coke producers turn out coke that is not uniform.

Mr. Barr: I think there is a great lack of uniformity in lots of coke from the same place. I do not know whether or not it is a difference in density of chemical composition. The preparation of the cupola with anthracite coal is much more uniform than with coke.

Mr. Whiting: It is difficult to get anthracite coal out here. I think coke will stand a greater number of remeltings.

Mr. Barr: The question is, is coal the better fuel for cupolas than coke?

Mr. Bowie: I have had a little experience with anthracite coal, but we do not use it altogether and we do not adopt quite the same method as the gentleman stated. We do not mix it. We use our beds of Lehigh lump coal, about 20 tons. We found that when we had light heats all coke was better, but for heavy castings, like general machinery castings, we found the coal better.

Mr. Vrooman: Stove plates can be run better with iron melted with coal than with coke.

Mr. Sercomb: When coal is coked in a heap what part of the heap makes the best coke, the interior or the outside?

Mr. Pittman: Coke comes out of the ovens averaging almost the same.

Mr. Barr: In our melting with all coke I found that the iron chilled more rapidly.

Mr. Pittman: I do not understand the matter of the iron cooling off more rapidly.

Mr. Barr: I do not mean to say the iron cooled off more rapidly, but it thickened more rapidly. It probably thickened at a higher temperature.

Mr. Pittman: Is there a difference in the color of the molten iron with coal as compared with coke?

Mr. Whiting: It is redder with coal.

Mr. Barr: In a large portion of my work we had to pay a great deal of attention to the hardness of the metal, and the variation of the hardness in cooling made itself very quickly manifest. I found that with coke it was necessary to blow with but little over half the pressure it is necessary to use in melting with coal.

Mr. Pittman: What was the difference in intensity of heat, if any?

Mr. Barr: I could not say.

Mr. Bowie: We had one class of work in which our experience was similar to that. I think I can bear you out in that. We did a great deal of experimenting to get the proper mixture to keep it from cracking. The foundrymen who made it before us claimed that they had a 2-inch chill and did not get a crack. When we chilled an inch it came near coming apart. We changed the fuel and when we melted with coal it did not chill so deep. When we came to test the iron it was not good. It did not have as deep a chill and was not good, even if it did not crack. It was not good when it did crack, and was not good when it did not crack.

Mr. Barr: I should think that stove plate work would show the difference quite distinctly.

Mr. Vrooman: I could generally find I could chill my stove plate iron down to the color of an orange and get a good result.

Mr. Barr: In other words, iron melted with anthracite coal retains its fluidity at a lower temperature than when melted with coke.

G. M. Sargent: To what do you attribute the difference?

Mr. Barr: I am inclined to think it is a little increase in the sulphur when melting with coke as compared to melting with coal. I think the coke with its open structure and free admission of cool air would have a tendency in melting the iron to produce more oxidation than coal would. I know this, that manganese is said by chemists to be a deoxidizing material. I know I can take an iron that will chill an inch deep and by adding one-half of 1 per cent. of manganese produce a result that will not chill more than half that deep.

Mr. Pittman: How does it affect the iron?

Mr. Barr: It makes the iron a darker color and better looking and makes it stronger. I made one little experiment that might be interesting to you. I picked out four wheels that were about as weak and brittle as I could find. I put them under a little drop of 100 pounds. A piece was broken out of the weakest wheel with three blows, the strongest stood nine blows, the average of the four being seven blows. I melted these four in a test cupola without any addition of iron whatever and obtained in the fluid metal enough to pour three wheels. I poured one wheel without the addition of anything, but I added one-half of 1 per cent. of manganese to the two other wheels. The wheel that was poured without the addition of the manganese we could not use. It came out in three pieces. With the other two wheels, one took 85 blows and the other 135 blows to break. Now remember, in the original wheels the strongest took only nine blows. What did it? My idea is that the chemical action of the manganese removed the oxide.

Mr. Fenner: It might be a change in the silicon. I think it changes the graphitic form. It strengthens the iron.

Mr. Pittman: What effect did you find the manganese had upon the silicon?

Mr. Bowie: It strengthened the iron very materially.

Mr. Pittman: I was told of some experiments to show the relationship between the amount of sulphur and the amount of silicon. The silicon seemed to reduce the amount of sulphur.

Mr. Fenner: I have had more experience with Fulton Lehigh than with coke. I like it better. I think it makes a stronger, more uniform casting.

Mr. Barr: It is an accepted fact that sulphur has a tendency to reduce the amount of graphitic carbon and then produce a higher chill, and if coke introduces more sulphur into the iron than anthracite coal then possibly the increase of sulphur would explain the difference in the chill.

Mr. Vrooman: Does sulphur harden iron?

Mr. Barr: Yes, sulphur hardens iron and makes it chill differently.

Mr. Vrooman: I had a piece of iron that could not be drilled, but when a piece of sulphur was put upon it it could be drilled.

Mr. Barr: In that case you produced sulphide of iron. Sulphur combined with iron produces a sulphide of iron that is soft.

Mr. Pittman: I know a case where a foundry had been using coke and had a good deal of trouble with their castings. They made an analysis of the coke and found a high per cent. of sulphur. They changed their coke and the iron came out all right.

Mr. Sargent: I would like to ask what amount of sulphur is eliminated by coking?

Mr. Pittman: It is generally considered that about one-half, if the method of coking is carried on properly, not too rapidly. But when the coking is carried on too rapidly and the heat too intense a portion of the sulphur is driven off, but not so much. Probably intense heat produces some chemical action that holds the sulphur in the coke.

Mr. Fenner: Would coke give it off quicker in the cupola than coal?

Mr. Pittman: I do not know; it is a question.

Mr. Barr: The sulphur must be given off some way when the coal is consumed.

Mr. Pittman: I think it would be worth while to try the effect of combined manganese on the sulphur.

Mr. Barr: So far as my experience goes the manganese has no influence on sulphur. It is on the oxides that would happen to be formed.

Mr. Pittman: Have you any idea what that action is?

Mr. Barr: It is a chemical interchange that takes place in which the oxidation passes to the manganese and passes off as slag. I believe that is the explanation. Manganese, however, is like sulphur—by increasing the manganese you get a brittle casting. With 600 pounds of ordinary iron you can use as high as 3 pounds, one-half of 1 per cent., without injury. Apparently all that 3 pounds is combined with oxygen and passes off as slag.

Mr. Sargent: Suppose you wanted to increase the chill without regard to other properties, what effect would it have upon the iron?

Mr. Barr: It would increase the depth of the chill. I am afraid of manganese. It is one of the most deleterious materials in wheels. I made 100 wheels and I put in one-half of 1 per cent. of manganese. I found that the wheels were strong but they did not make but a little over one-third of the average mileage. I was a good deal interested in that subject at one time.

Mr. Sercomb: I would like to ask Mr. Pittman what amount of tar is abstracted from coke and if to any extent it is saved and disposed of? The reason I ask this question is that coke is cheapening up.

Mr. Pittman: I do not think any of the Northern coke ovens save any of the by-products. I believe they are doing so to some extent in the South, and in Europe they save the ammonia in various localities.

Mr. Barr: What is the difference in volume between a ton of coal and a ton of coke?

Mr. Pittman: In 72-hour coke the volume is a trifle more than the coal. The coke has a structure that is 50 per cent. of air space that does not exist in the coal.

Mr. Barr: There is another charge I have against coke, and that is this: Owing to the porous structure it will absorb a large amount of moisture, and in fact absorb so much that it will make quite a difference in the operation of the cupola.

Mr. Pittman: Coke that is used in the neighborhood of the oven is affected more than cokes used here. In transit a large amount of the water is evaporated.

W. D. Sargent: That would depend upon the weather.

G. M. Sargent: What is the difference in melting with 100 pounds of coal and 100 pounds of coke?

Mr. Pittman: I cannot answer that question.

Mr. Barr: My experience is that anthracite coal will melt about 6 pounds, and coke from 6 to 9.

G. M. Sargent: The charge from the ovens is drawn out by hand, is it not, at the present time?

Mr. Pittman: There are now coke drawers that can work more rapidly.

Mr. Sercomb: A man in my office made this statement: That he had just as good results with 48-hour coke as with 72-hour coke. In fact, he said the supply of 72-hour coke was limited, and for that reason it was more sought after.

Mr. Pittman: There is one thing about the black ends. They may be lumps of coal. In some places they use a pulverizer, and there may be some lumps that are not thoroughly converted. A poor coal will make a better coke when pulverized.

Mr. Sercomb: Do you suppose coke could be made from the Kansas coal?

Mr. Pittman: It probably could if the quality was good enough.

Mr. Sercomb: It is a coal that is used a great deal by blacksmiths. It is very free from sulphur. It lies cropping out of the ground. It is a great coal for generating steam.

Mr. Vrooman: Did you say if iron was melted too hot it would harden it?

Mr. Pittman: Yes, if it is melted too hot I think it will harden it.

W. D. Sargent: In regard to iron melting with certain kinds of coke, does that depend largely upon the sulphurous qualities of the coke?

Mr. Pittman: It is affected by it to some extent, I think.

W. D. Sargent: Provided you were not particular about the results, would it be just as economical to use the high sulphur coke?

Mr. Pittman: I think you would melt a little more iron.

Mr. Bowie: Lime has been used in some coke ovens to take out the sulphur.

It was moved and carried that a vote of thanks be extended to Mr. Pittman for his excellent paper.

The meeting then adjourned.

Puddlers Three Turn System.

The puddlers employed at the Aetna-Standard Mills, Bridgeport, Ohio, have consented to work on the three turn system. This item of news deserves more than passing notice for the reason that such an arrangement has hitherto met with determined opposition. Not very many years ago sheet mills worked only two turns. There were eight quiet hours in the mills every night and coal being burned to waste to keep furnaces hot for the day turn. When three turns was proposed all sorts of dise confusion and trouble was predicted by the men. If a vote was taken to-day on going back to two turns it is doubtful if an affirmative vote would be registered. The action of the Aetna-Standard puddlers is worthy of commendation. It will effect a great saving in fuel and a small amount of labor cost, and it is to be hoped that the innovation will be attended with success.

Two guns, one of 10 inch and the other of 12 inch caliber, have just been completed at the Watervliet, N. Y., arsenal, and will soon be shipped to the testing grounds at Sandy Hook. The 12-inch gun will be fired from a special carriage. There are about 28 of the 8, 10 and 12 inch guns nearly finished.

Recorder of Speed of Driven Shafts.

This device was designed by John C. Henry of Westfield, N. J., especially for use on locomotives, railway-cars and the like, the object being to provide simple and reliable mechanism for indicating to an engineer or other official the speed at which the train is running, and also for making a permanent record of the varying rates of speed at which the train has passed over the road. These results are accomplished by the use of synchronously rotating electric generator and motor, the former being actuated by the driven shaft, such as an axle of the locomotive or car truck, and the latter operating the indicating and recording mechanism.

The generator or dynamo is mounted on or actuated by a shaft, A, preferably

alternating current of electricity is generated in the coil. This current is led to any suitable electric indicator. The curved solenoid E, through which the current passes, and into which is sucked the core F, pivoted on a fulcrum, *f*, and carrying an index, G, which moves over a graduated scale or dial, *g*. A spring, H, resists the pull of the solenoid, and returns the index to zero when the current ceases. The intensity of the cur-

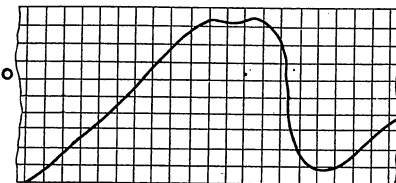
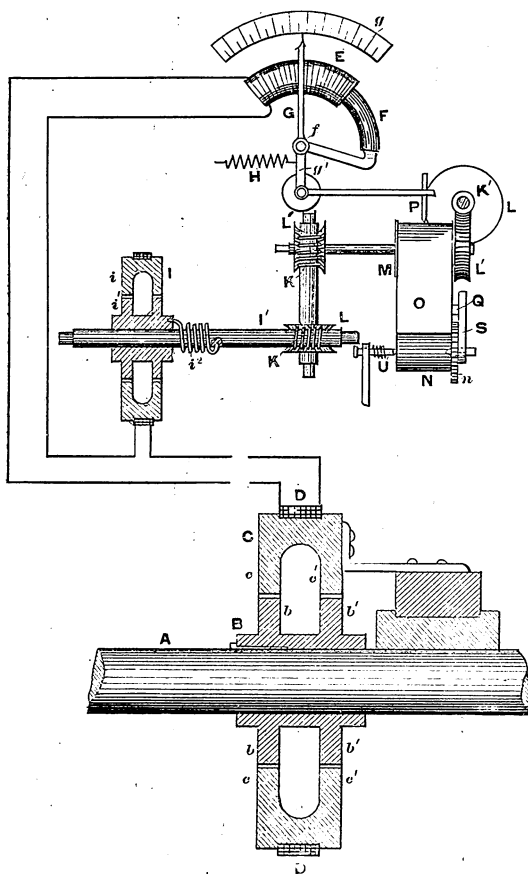


Fig. 5.—Record.

two spools, N N', which pay out and wind up the paper ribbon O. The record is made on this ribbon by means of a pencil, P, which is moved transversely to the paper by an arm, *g*, forming an extension of the index. The ribbon is ruled with longitudinal lines to indicate speed in miles per hour, and with cross lines to indicate predetermined intervals of distance run. The pencil traces a curved line, as shown in Fig. 5, which enables one to see what speed was attained at any given point during the run, for how great a distance it was maintained, and what variations in speed took place. The spools are positively driven by the intermeshing gears *n n'*, engaged by pawls Q R, which are pivoted to a lever, S, actuated by a cam, T, on one of the shafts of the winding mechanism. The gears are operated by the pawl Q when the lever is moved in one direc-



Figs. 1 and 2.—Indicator and Recorder and Section of Generator.

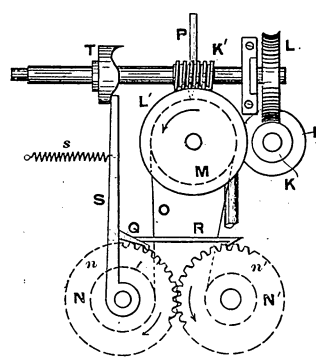


Fig. 3.—Side Elevation of Recorder.

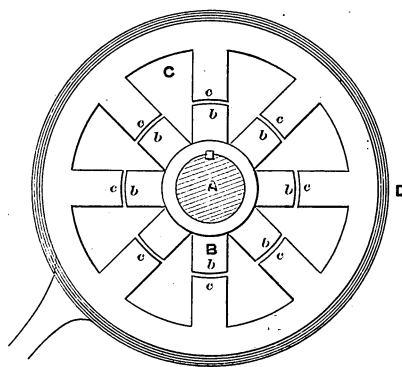


Fig. 4.—Side Elevation of Motor.

RECORDER OF SPEED OF DRIVEN SHAFTS.

the locomotive truck, whose wheels are not liable to be slid on the rails by either the brakes or the steam pressure in the cylinders.

The dynamo is composed of a magnet, B, having an annular series of radial pole pieces, *b b'*, and keyed securely on the axle A. The magnet constitutes a rotating field. It is preferably a permanent magnet, as shown, though it may be an electro magnet if desired. Concentric with the magnet and surrounding it is the stationary armature C, consisting of a ring having radial pole pieces, *c c'*, projecting inwardly in the planes of the magnet poles *b b'*. A coil of insulated wire, D, is wrapped around the ring either externally or internally, and when the axle A turns an

rent varies directly with the speed of the axle A, and as the position of the index varies with the current strength, the variations in speed are instantly shown by the index. The current is also led to a motor, I, which may be in series or in shunt with the solenoid. It consists, preferably, of an annular field magnet, *i*, and a rotating permanent magnetic armature, *i'*, similar in construction to the dynamo. The armature is loose on the shaft I', being connected therewith by a helical spring *i''* to ease the starting of the motor. The shaft I' is connected by suitable gearing, preferably worms K and worm gears L, with the driving drum M of the recording mechanism. This comprises, in addition to, the driving drum,

tion by the cam, and by the pawl R when the lever is retracted by its spring *s*. The cam is so shaped that the lever is actuated and the gears rotated irrespective of the direction in which the axle, motor and worm shafts may be turning.

Since the motor is driven in synchronism with the dynamo, both having the same number of pole pieces, the revolutions of the recording mechanism vary directly with those of the axle A, though at a much reduced speed. The feeding of the paper is done by the worm K', which meshes with the gear L' on the shaft of the drum M. The spools N N' are held in frictional contact with the gears *n n'* by the spring bearing pins U, which afford a means

for readily removing the spools when a new ribbon is to be inserted. The tendency of the gears is to wind the paper on to both spools N N', but since the spools have only a frictional contact with the gears, the result is that the paper is simply drawn tight over the drum M. The feeding is done wholly by the drum, and, in whichever direction it may be turning, the slack is taken up by the spool toward which the paper is fed.

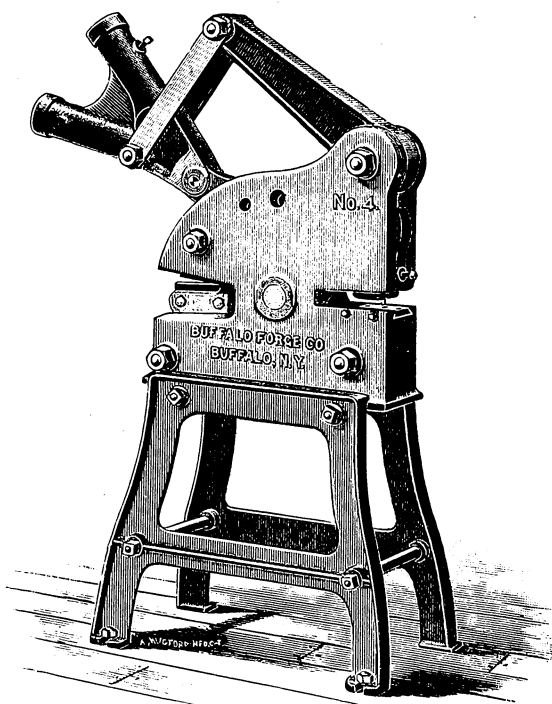
The Buffalo Punch, Shear and Bar Cutter.

The construction of this machine is such that the operator can use it without a helper on the heaviest work. No adjusting is required in changing the work, the machine being always ready for performing any of its three

elastic limit of 35,000 pounds and a reduction of area of 15 to 20 per cent. They are in a position to furnish a metal which is as rigid under transverse tests as ordinary structural steel.

A Remarkable Economy.

It may not be generally known that the Standard Oil Company are by far the largest consumers of tin plates in the United States. Their annual purchases reach an average of 750,000 boxes, or about one-third of the total imports. The tin plates are manufactured into oil cans, and a large proportion of the material is re-exported in this form, filled with petroleum. An interesting fact in connection with the subject was recently mentioned by a prominent New York tin plate merchant, as illustrating the way in which large economies may sometimes be



THE BUFFALO PUNCH, SHEAR AND BAR CUTTER.

functions of punching, shearing or bar cutting. The mechanism consists, as will be seen, in a combination of levers, so arranged that the cutting is done up from the bottom. The machine is built in four sizes by the Buffalo Forge Company of Buffalo, N. Y. Capacity No. 1 will shear $\frac{1}{4}$ -inch strap iron $1\frac{1}{2}$ inches wide, will punch $\frac{1}{8}$ inch in $\frac{1}{4}$ -inch iron and cut off $\frac{3}{8}$ inch. Capacity No. 2 will shear $\frac{1}{4}$ -inch strap iron 2 inches wide, will punch $\frac{1}{8}$ inch in $\frac{1}{4}$ -inch iron and cut off $\frac{3}{8}$ inch. Capacity No. 3 will shear $\frac{1}{4}$ -inch strap iron 3 inches wide, will punch $\frac{3}{8}$ inch in $\frac{3}{8}$ -inch iron and cut off 1 inch. Capacity No. 4 will shear $\frac{3}{8}$ -inch strap iron 3 inches wide, will punch $\frac{1}{4}$ inch in $\frac{1}{2}$ -inch iron and cut off $1\frac{1}{4}$ inches.

Some very remarkable progress has been made lately by the Pittsburgh Reduction Company in obtaining aluminum material of high tensile strength. They are ready to place on the market sheet aluminum with a specific gravity not much above the ordinary aluminum sheet, with a tensile strength of 50,000 to 60,000 pounds per square inch, an

effected by a little practical good sense judiciously applied. The Standard Oil Company for several years used a special size of coke plates—namely, $14 \times 19\frac{1}{4}$ inches, each box containing 120 sheets, and giving material for 60 cans—two sheets forming the body of one can. Not long ago it struck one of the officials that the trimmings left over were excessive, and practically valueless. He accordingly set to work to remedy this waste, and soon discovered that two sheets of $14 \times 18\frac{3}{4}$ inches would serve the required purpose equally well and leave next to nothing in the way of waste material. The company have lately used special plates of this size, getting for the same price 124 sheets to the box, instead of 120 as before. They are, in consequence, able to make two more cans out of each box, or about 1,500,000 in the year, without the expenditure of another cent.

The Armours of Chicago and Kansas City are reported to have purchased 2400 acres of land on the Hackensack meadows, in New Jersey, where they will form stockyards and build large slaughter houses.

Management of Men and Manufacturing Industries and Hints on Labor's Problem.

FIFTH PAPER.

Recognition of and Kindness to Employees.

BY THOS. D. WEST.

It would be very difficult for any court to find, by trial, many manufacturers who could not prove that in the erection and management of their plant more or less consideration was given and money expended for the welfare and comfort of their employees.

Thousands of dollars have been expended by firms in equipping plants with good ventilation, light, sanitary conveniences and almost every kind of device that modern appliances can offer to make cheerful, comfortable and convenient work shops. In nine cases out of ten the employees are more likely to abuse or ill use the privileges than to give the employer any credit for his kind consideration. The majority will insist that such improvements were not given with the view of making the workman's lot any more cheerful or lighter to bear, but solely because a larger and better return in work or profit would be expected.

We admit that it is conducive to that end, but not to the degree which workmen generally insist it is, and if it were the purport of this article to prove it we would have very little difficulty in doing so; but knowing as we do that there are employers who do consider the welfare of their men in the construction of buildings and improvements, and in the majority of cases only get abuse for it, we will endeavor if possible to ferret out the cause for this lack of appreciation on the part of the employees.

Fortunately, or unfortunately, it has been my lot to know from experience the true feelings, thoughts and ideas which workmen possess when they stand on a low plane, because the writer started at the age of ten to assist in making bloated bond holders, supporting non-producers in luxury, creating the wealth of the world, &c.

Our whole trouble is due to not thoroughly understanding and retrying each other's side of the question. Employers might go on and furnish a free banquet for dinner every day, have reclining chairs for an hour's noon "nap," take their men home in a four in hand every night, and at the close of the year divide the dividends, if any, among their men and still fail to have them contented. Why? Simply because they would still believe that the employer had the "lion's share."

Little does the man who has never been a "commoner" know of or realize the true feelings and ideas of a workman who has false ambition and looks from a low level at an employer through the lens of ignorance.

They never look at millionaires and think that when they do have a banquet three times a day, dress well and have the best of the land, nearly every cent they pay for it is returned to labor, giving employment to thousands of people, and that at the end of life they leave all their wealth to continue being beneficial to mankind. They never stop to think about the labor of the world that is employed in manufacturing luxuries, furnishing amusement, &c., although they are not elements really necessary for the maintenance of life.

Every man who has a small bank account is a capitalist; and the more of such there are the less is the tendency of opportunity for massing wealth in the hands of a few. If labor desires a more even distribution of wealth there is but one sure way of obtaining it, and that is, strive by industry and "ability" to secure it. If you cannot be a "big fish in the puddle," you can be a little one, and thus assist in creating a more even distribution of the country's wealth, which labor is calling for.

It is only against the miser or hoarder who will not invest his wealth that labor should always be "bucking." Such are its real enemies.

"That's all right," says some one a little higher up the ladder who does not want to labor any more or is too lazy to do so; "we recognize all you say to be true, but we still object to the unjust division of wealth. Our stock in it should be larger. We do not object to purchasing more of life's luxuries, and also becoming beneficial in order to assist in furnishing employment to labor."

Now, upon the answer to such logic hinges some solution of the problem. It is not the purport of this article to show all of the ins and outs of the subject. Suffice it to say that the manufacturers and all well informed men of to-day know that three-fourths of American wealthy business men are self made, and that there is nothing to prevent any man who has brains, who will put an end to drinking, idleness and giving more time to other people's business than his own, from rising and becoming an employer of men, and perhaps a millionaire. We also know that if to-day all the wealth of the world were equally divided, the lack of self denial and power to hold money and manage it would in an astonishingly short space of time place it again in the hands of those possessing energy, brains and ability. These are the three elements that to-day are most necessary to be discussed and thoroughly illustrated by employers in a manner to be recognized by the employee before he is going to be able to intelligently appreciate kindness or respect ability and recognize such as of value. It is the weight of responsibility that often loads down well to do business men or millionaires so heavily that it makes it impossible for them to take any pleasure out of life.

The time is here when it behooves all employers to take an interest in any element that can tend to enlighten and prove to the employee concerning the responsibilities and care carried by a manager, boss or business man, and the ability required for success in any enterprise. The majority of workmen think that money is the only element required to make money, and that if they could control a few thousands they would soon be rolling in wealth. Brains or ability with them are a secondary consideration. Their knowledge of their power and of their necessity are very limited. Their maxim is more, "any brainless dude having money can make money." A workman's conception of capitalists and business men is strengthened and verified in many erroneous, deceptive ways that could be exposed.

One great factor lost sight of is the sincerity of a workman's ideas and opinions. Many think their actions are chiefly inspired by prejudice, by a desire for spite or by a love for destruction of property. This is where many are mistaken. Workmen are sincere and conscientiously think they are right and honestly justified in worrying

and "bucking" an employer to their full power. "He is an enemy robbing us of our just share in the wealth of the world. Down with him!" is the cry. And the majority feel and mean every word of it. Some effort must be made to guide them aright in understanding the principles in political economy that adjust and award wealth to man, and counteract those who for self gain lead them to error.

The manufacturer and employers of labor have too long permitted the buncombe politician, lawyer and theorists to mislead labor in direct opposition to its own interest. We have had nearly all kinds of "ages" but the practical age, and that is now drawing in upon us with a brilliancy that cannot but enlighten and make the world better for its appearance. There will come a recognition and development of brains, ability and energy by all classes. It will call out and support practical literature, discussing past errors. Ability must prevail in order to maintain civilization and do justice to all in a much more satisfactory degree than is done to-day, and the sooner employers and experienced, practical men take a hold of this—the duty that awaits them—so much nearer are we to seeing the bars taken down which to-day so unjustly separate labor and capital. Capital is to blame, like labor, in many ways for the strife existing between them. One of its errors is that it holds aloof too much from labor. Employers must endeavor to get into closer contact with their employees, and, instead of only spending \$10,000 for shop conveniences for the benefit of employees, and then passing them by on the street with a recognition cold enough to chill the blood before the vibrations of "how de do" can reach their ears. Try stopping to cheerfully inquire after their welfare, and ask if there is not a good word you might be able to put in for them somewhere. Learn if in going to buy that little piece of property they are going right about it. Make sure that no sharks have them in tow, and if they have sickness at home let them realize that you sincerely sympathize and can be relied upon as a friend in need should the services of such be required. Don't be in any hurry to leave them. Let them tell their troubles in their own way and advise them the best you can, leaving them with the instruction to call upon you any time they might want advice or assistance. Such courtesy and treatment does not involve any sacrifice of control or independence in your management of men as employees, and if you have never tried it, do so with a few of your worthy employees, and if the writer's experience would lead him to predict results, it would be that half a dozen such made friends would be of more value around your plant than any two or three thousand dollars that might be invested in conveniences for the benefit of employees.

As an employer striving to secure recognition for kindness and consideration from men while engaged in labor, your kindest acts and thoughts will often be misconstrued as for self gain. As an individual outside of your works, wholly disinterested in what a man may be doing, you can by warming up to those worthy of your respect and attention make friends of workmen who would follow you through thick and thin. "Warm up" to those you can and they will take care of the bilious, prejudiced cranks and would be bosses for you and assist them in making their existence still more miserable if

they insist on fighting against common sense justice and making themselves disagreeable.

Of course an employer cannot create appreciation or respect for his good will in one day. He has got to await developments for opportunities when kindness and substantial assistance can in a kind, dignified manner be tendered. But when you have gained the confidence of your employees you are in a position to make a confidant of them when adversities or hard times come to you. When it is absolutely necessary that less wages must be paid in order to meet the market or procure work, you can generally count upon your men accepting it with a grace you cannot mistake, as complimentary to the confidence they repose in you as an employer. Never forget that it is a poor rule that will not work two ways, and that when you can command a fair price for products, and business is good, be not too slow in raising their wages, especially to those possessing energy, brains and ability.

Southern Pig Iron Freights.

The Queen and Crescent Route has issued a new pig iron tariff, effective January 28, governing rates between the following points:

To	From Dayton and Rockwood, Tenn.	Chattanooga, Tenn.	Birmingham, Ala.
Aurora, Ill.	\$3.20	\$3.40	\$3.65
Chicago, Ill.	3.20	3.40	3.65
Columbus, Ohio	2.70	2.90	3.40
Detroit, Mich.	3.40	3.60	3.85
Dubuque, Iowa	3.20	3.40	3.65
Joliet, Ill.	3.20	3.40	3.65
Leontia, Ohio.	3.25	3.45	3.95
Milwaukee, Wis. (all rail)	3.65	3.85	4.10
Milwaukee, Wis. (rail and water)	3.35	3.55	3.80
Minneapolis, Minn.	4.90	5.10	5.35
Muncie, Ind.	2.80	3.00	3.25
Peoria, Ill.	3.20	3.40	3.65
Racine, Wis.	3.65	3.85	4.10
St. Paul, Minn.	4.90	5.10	5.35
Waukegan, Ill.	3.65	3.85	4.10
Zanesville, Ohio	2.95	3.15	3.65

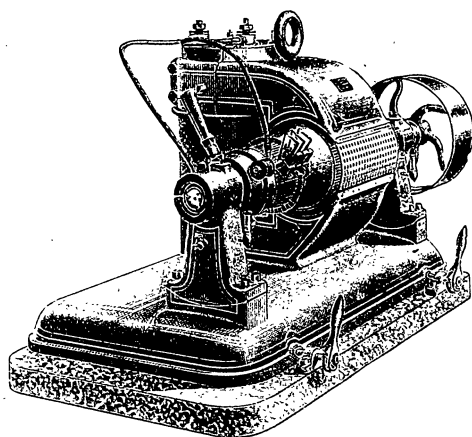
The thirty-third meeting of the Foundrymen's Association will be held at the Manufacturers' Club in Philadelphia on Wednesday evening, February 7, at 8 o'clock. W. J. Keep of the Michigan Stove Company will present an address on "Foundry Chemistry," which will be, in a measure, an answer to an address made by the Hon. E. A. Wheeler of Sharon, Pa., on "Furnace vs. Foundry Practice," before the Western Foundrymen's Association at their last meeting. There will also be a paper read from the James Reynolds Mfg. Company of New Haven, Conn., on "Molding Machines." A statement as to the condition of the foundry trade will be presented by the chairman of the committee, composed of representatives of the different sections of the foundry business, after which a discussion will take place on the subject.

The United States Geological Survey has issued a number of topographical maps of sections of New York State, Massachusetts and Connecticut. These maps are on separate sheets, 20 x 16½ inches in size, and show in detail the location of villages, highways, railroads, streams and boundary lines, besides indicating the density of settlement, and

showing very plainly the contour of the country. The sheets thus far issued comprise the following sections: In New York—Coxsackie, Poughkeepsie, Troy, Albany, Schenectady, Durham and Cohoes; in Connecticut—Sarnford, Carmel and Glove, and Pittsfield sheet, in Massachusetts.

The Colburn Dynamo.

This dynamo was designed by the Colburn Electric Mfg. Company of Fitchburg, Mass., to give a larger output than those of the pattern that has so long been the standard of the company. The field coil is wound upon a bobbin that can easily be taken off. Cast solid into the lower pole is a wrought iron core, which is made tapering and is keyed to the upper pole, thereby allowing the latter to be removed if necessary. The self-aligning boxes are turned on an arc of a circle on the same center that the pole faces are cored upon. The boxes are provided with chain oil feed and oil sight showing height of oil in the reservoir at all times. The commutator is extra large, with



THE COLBURN DYNAMO.

tempered segments, and there is but one convolution of wire on the armature for each commutator segment. The large non-sparking space upon the commutator allows of the dynamo being run from no load up to its full capacity and under or over speeded without showing sparks. As there is no sparking the wear on the brushes and commutator is reduced to a minimum. The brush holders are of an improved pattern, giving any desired tension to the brushes immediately. It is claimed that these dynamos have perfect regulation and the highest efficiency at medium speeds.

Preparations are under way for the manufacture of 16-inch guns at the Watervliet, N. Y., Arsenal gun shops. Bids have been received for the construction of lathes and other machinery. The estimates will be sent to Washington for the approval of the War Department. The guns will not be manufactured inside of 18 months, as it will require that time to make necessary arrangements and place the machinery in position. The lathes will be so constructed that 12, 14 and 16 inch guns can be manufactured. The plans for the gun making machines were prepared by Anthony Victorin. Watervliet Arsenal, when the machinery is in operation, will be turning out the largest

guns manufactured in this country. The cost of a single gun of the largest dimensions will be \$120,000.

The New Castle Glass Tank Furnace.

The new continuous window glass tank furnace of the Shenango Glass Company, New Castle, Pa., was put in operation at midnight on Friday, and is running successfully. There is not a foot of natural gas or any other kind of fuel in this factory, the whole plant having been started and will be continually operated with producer gas made from coal. This factory will give employment to over 300 men. The new furnace is equal to 36 pots, and takes the place of two old pot furnaces that were abandoned eight months ago. The S. R. Smythe Company built this tank furnace and the entire plant from the ground floor up, and same has all their patented improvements, and they not only built and designed the plant, but put it in operation, and will continue to operate it until the Glass Company

are well acquainted with its working. This tank is so constructed that it will produce silver clear glass. It just took four weeks and one day to get this tank filled and ready to blow. As the utmost care was taken in doing this, the result is that there is not one block cracked or broken and the cap is in excellent shape. The tank was not filled with cullet; there was only just sufficient cullet put in by the Smythe Company to properly glaze the face of the blocks, it being filled up with raw batch.

The *Gazette* of Fort Worth, Texas, states that new machinery has been added to the Olive Iron mine near Llano and large quantities of Bessemer iron ore are now being obtained from the mine.

The Wrought Iron Bridge Company, Canton, Ohio, have secured a contract for the erection of a steel bridge for the Pittsburgh, Coraopolis & Neville Island Electric Railroad Company. The bridge will be 1086 feet long, having three spans and five piers, and will cost about \$60,000. Work is expected to commence about March 1 next.

Six guns manufactured at the Japanese Government Arsenal at Osaka have been recently supplied to the Portuguese government.

Treasury Decisions.

Entry of Copper and Copper Matte.

TREASURY DEPARTMENT,
December 23, 1893.

SIR: The Department has received your letter of the 14th inst., in which you describe the proceedings which were taken in reference to certain copper and copper matte received at your port under warehouse and transportation entry. It appears that the goods were kept in the cars of the railroad company during the interval between their arrival at your port and the time when they were entered for transportation, and you ask whether they should not have been placed in bonded warehouse.

It is undoubtedly the duty of the consignee in such cases to make immediate entry after the arrival of their goods, and had the railroad company insisted on immediate delivery you would have been justified in sending them to general order. In the instance under consideration it appears, however, that the goods remained in bond on the cars with the consent of the company, and were then duly transported. The Department holds that the goods should have been entered for warehouse or for exportation upon arrival at your port, and that it was the duty of the Collector, when such entry was not made within a reasonable time, to take possession of the goods and to send the same to warehouse under general order.

In future instances of this kind you will be governed accordingly.

Respectfully yours,

CHARLES S. HAMLIN,

Assistant Secretary.

COLLECTOR OF CUSTOMS, Galveston, Texas.

Cartridge Shells, Paper and Metal.

Before the U. S. General Appraisers at New York, November 23, 1893. In the matter of the protest, 20,335-4, of J. A. R. Elliott & Bros., against the decision of the Surveyor of Customs at Kansas City, Mo., as to the rate and amount of duties chargeable on certain cartridge shells, imported per "Majestic," June 20, 1893. Opinion by Wilkinson, General Appraiser.

The goods are cartridge shells between 2 and 3 inches in length, and about $\frac{1}{2}$ inch in diameter. The shell is a paper cylinder with a metal base and cap.

The merchandise was assessed with duty at 45 per cent. under paragraph 215, N. T., and is claimed to be dutiable at 25 per cent. under paragraph 425, N. T.

Sample shells from the importation were submitted to two of the leading manufacturers in the United States, who inform the board that the component materials are: Metal, 65 to 70 per cent.; paper, 30 to 35 per cent. We find that paper is not the component material of chief value, and overrule the protest.

Charcoal Bar Iron—Application of Second Proviso in Paragraph 136, N. T.

Before the U. S. General Appraisers at New York, November 23, 1893. In the matter of the protest, 21,451b-10,889, of S. D. Kimbark, against the decision of the Collector of Customs at Chicago as to the rate and amount of duties chargeable on certain charcoal bar iron, imported per "Norge," December 17, 1892. Opinion by Wilkinson, General Appraiser.

The merchandise covered by the protest is charcoal bar iron less than $\frac{1}{2}$ inch in diameter, costing about \$36 a ton. It was assessed with duty at 1.1 cents a pound under paragraph 136, N. T., and

is claimed to be dutiable at \$22 a ton under the same paragraph.

Paragraph 136 is as follows:

Round iron, in coils or rods, less than $\frac{1}{8}$ inch in diameter, and bars or shapes of rolled iron, not specially provided for in this act, $1\frac{1}{10}$ cents per pound: Provided, That all iron in slabs, blooms, loops, or other forms less finished than iron in bars, and more advanced than pig iron, except castings, shall be rated as iron in bars, and be subject to a duty of eight-tenths of 1 cent per pound, and none of the iron above enumerated in this paragraph shall pay a less rate of duty than 35 per centum ad valorem: Provided further, That all iron bars, blooms, billets, or sizes or shapes of any kind, in the manufacture of which charcoal is used as fuel, shall be subject to a duty of not less than \$22 per ton.

As a duty of 1.1 cents per pound is \$24.64 a ton, it is clear that the second proviso can apply only to the iron named in the first proviso, and not to that covered by the first portion of the paragraph.

We find that the bar iron in question is not less finished than iron in bars. The protest is overruled accordingly.

The Liability of Trustees.

A question as to the liability of the trustees of a corporation for the debts of the corporation was rather summarily disposed of in New York by Judge Freedman of the Superior Court in the action brought by James P. Witherow to recover of John D. Slayback, Charles Raymond and Frank B. Robinsen of this city the sum of \$11,000, with interest from October 6, 1886, upon a claim alleged to be due by the Port Henry Steel & Iron Company of Port Henry, N. Y. The ground of liability was that the company had failed to file an annual report as provided by the statute for the year 1886, and not until February, 1887, for that year, nor any in 1888; and also that in filing the report of the full payment of the capital stock, which was \$100,000, and was stated to have been issued in full for cash, the said defendants, as trustees, made false statements in that a large amount of the stock had never been issued and that a considerable quantity of assets, accounting, it was alleged, to \$75,000, had never been accounted for. It was shown that a receiver of the corporation was appointed in June, 1887.

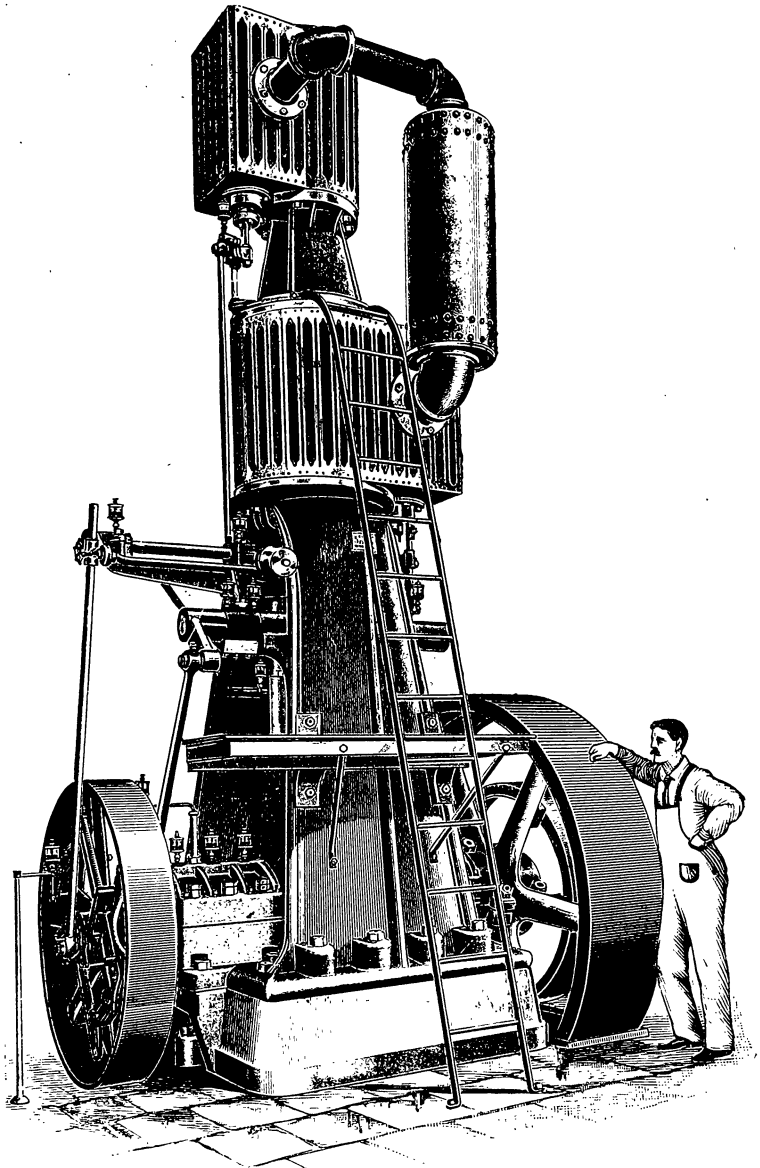
The plaintiff's claim arose on a note given in October, 1886, which did not fall due until April, 1887, and which was indorsed by the words "Andrew Dickey, treasurer," without the name of the corporation. Counsel for the defendants raised the point that this indorsement was not the indorsement of the corporation, and would be effectual only to bind Andrew Dickey personally.

Judge Freedman granted the motion to dismiss the complaint, holding that as there was a receiver appointed in June, 1887, there was no obligation to file the report in January, 1888. He also held that although the note was dated in October, 1886, it did not fall due until April, 1887, and as a report had been filed in February, 1887, that the plaintiff was not prejudiced by the non-filing of the report in 1886, or January, 1887, as provided by statute, as he at that time had no claim under any circumstances which had accrued against the corporation before the making of the report, and upon the defendants' application an extra allowance was granted.

The Fitchburg Tandem Compound Engine.

The engine we illustrate herewith is of the tandem compound condensing vertical type, having high pressure cylinder 16 x 20, low pressure 27 $\frac{1}{2}$ x 20, the engine making 210 revolutions. The steam pressure to be carried is 130 to 140 pounds, and the power to be developed 350 to 400 horse-power. The exhaust from the high pressure cylinder is taken through a steam jacketed re-

The main crank shaft is a steel forging, the bearings being 12 inches in diameter by 24 inches long, the cranks being counterbalanced carefully for the centrifugal force of the connecting rod and for the weight of the reciprocating parts. The connection with the line shaft is made in two of these engines which were sent to the Oakland Gas Light & Heat Company, Oakland, Cal., through a Hill friction clutch, one-half of which is a part of the fly wheel, the other half being keyed to the heavy



THE FITCHBURG TANDEM COMPOUND ENGINE.

ceiver to the low pressure, the receiver having also an outside cover to prevent all radiation, the steam entering the low pressure cylinder somewhat superheated, giving the closest economy.

The valve of the high pressure cylinder is operated directly from the automatic shaft governor, giving any point of cut off from zero to two-thirds stroke. The valve of the low pressure cylinder is operated from an adjustable eccentric on the back of the governor case, giving a range of cut off from one-fifth to two-thirds, the rock shaft passing through boxes upon the main frame to the opposite side of the engine, as shown. Both these valves are of the patented expandable type, permitting compensation for all possible wear during the life of the engine.

line shaft, one of the engines being at either end of this long line, permitting both engines to be worked together, or either separately, the line shaft having also a cut off coupling in its middle so that one half of the line can be run by each engine. The weight of the engine complete is about 70,000 pounds. The builders of it, the Fitchburg Steam Engine Company of Fitchburg, Mass., are building many sizes of vertical engines, both cross and tandem compound, and all sizes of horizontal engines from 700 horse-power down.

Peoria, Illinois, is contesting with Streator, in the same State, for the location of a proposed tin plate plant. The citizens of Peoria are asked to contrib-

ute 5 acres of land and a cash bonus of \$25,000. In return the promoters of the tin plate project guarantee to give steady employment to 300 persons. This would indicate the erection of a sheet mill as well as tinning works. The promoters are stated to be practical manufacturers from Pittsburgh, who prefer a location further West and are seeking proximity to Central Illinois coal fields to secure cheap fuel.

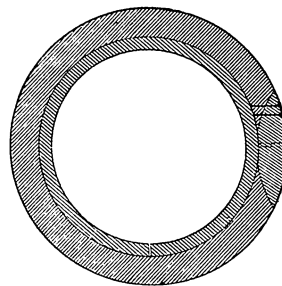
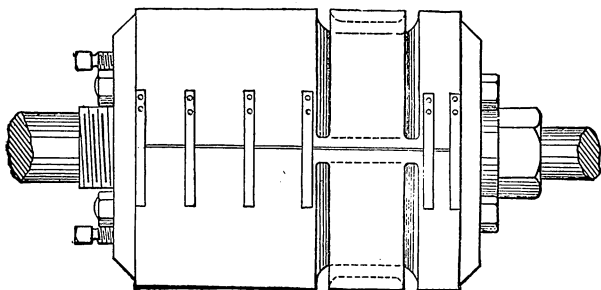
The Naval Stability Board, of which Commodore Walker is chairman, reported that the new ships "Machias"

A Criticism of American Machinery.

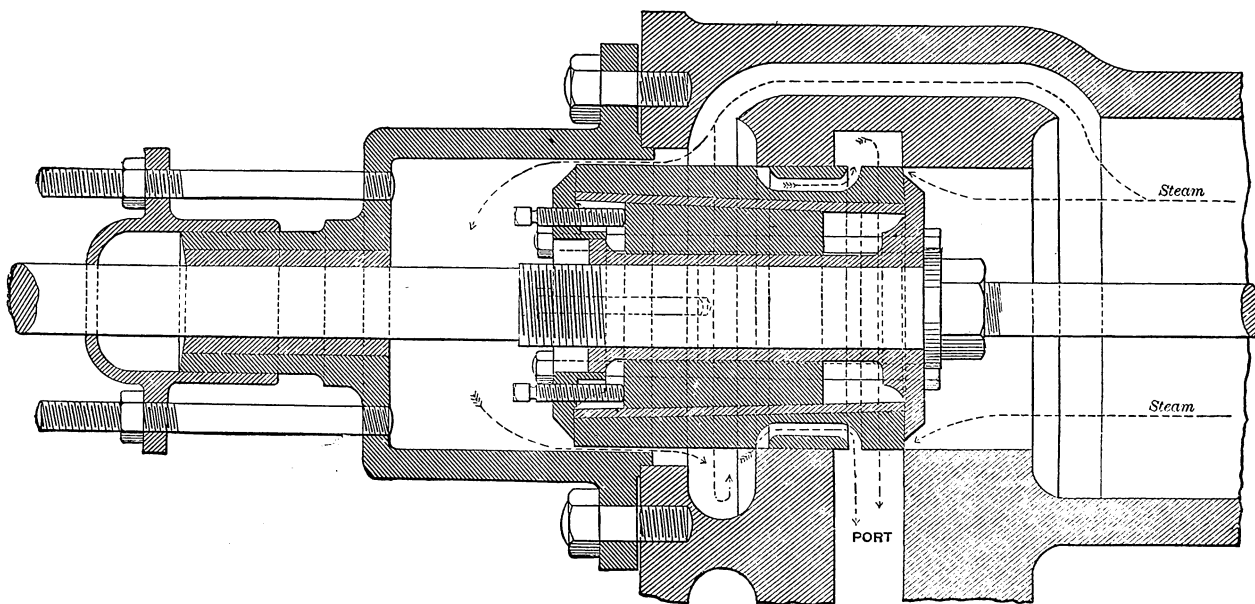
The Reuleaux incident has given rise to a number of debates on the relative development of building machinery in the United States and in Germany, which have gone far beyond the narrow field touched upon by the learned German professor. The latest contribution to this specific subject and to the more general subject of American practice in the technical arts comes from Professor Riedler. That engineer has had exceptional opportunities to study American methods, having been repeatedly in this country and having been called upon

States. He acknowledges, however, that American instruments of precision of greater perfection are used in the examination of machines. He states that Americans have for a long time employed large sums for fitting out their machinery. He refers to cases where the indicators, automatic recording appliances, &c., have cost thousands of dollars.

The influence of accuracy in measurements in industrial work should appear first of all in the machine tool branch. In this respect it must be admitted that in America machine tools are frequently employed in much greater



Sectional View of Packing Rings.



Expansive Valve.

THE FITCHBURG TANDEM COMPOUND ENGINE.

and "Castine" are unsafe with their present armament, and recommended that they be cut in two and 14 feet be added to the hull. This, it is thought, will remedy the trouble, and at the same time provide more coal space. The estimated cost of the alteration is \$30,000.

We have received from *The Daily News*, Chicago, a copy of *The Daily News Almanac and Political Register* for 1894. It is a volume of 416 pages, containing a very great deal of interesting statistical information, not only political but of a general character, carefully compiled by Geo. E. Plumbe, A.B., LL.B. Price, in paper covers, 25 cents; in cloth, 50 cents.

more than once to co-operate as an expert in larger undertakings in the United States. He has delivered a lecture lately before the Verein zur Beförderung des Gewerbfleisses, the principal aim of which, of course, was to instruct his German audience. In the course of it, however, he has criticised American practice, having done so occasionally in a very pronounced and emphatic manner. American readers will take relatively little interest in his commendation of some of our work, but may possibly find something to instruct them in those parts of the lecture in which he claims superiority for his own country.

Professor Riedler denies that German apparatus for fine measurements are inferior to those produced in the United

States. He acknowledges, however, that American instruments of precision of greater perfection are used in the examination of machines. He states that Americans have for a long time employed large sums for fitting out their machinery. He refers to cases where the indicators, automatic recording appliances, &c., have cost thousands of dollars. The influence of accuracy in measurements in industrial work should appear first of all in the machine tool branch. In this respect it must be admitted that in America machine tools are frequently employed in much greater development than in Germany, but this is alone due to the manufacture of large quantities and to the more minute division of work brought about by it. Professor Riedler claims that the manufacture of large quantities does not exist in Germany because consumers make higher demands. This distinction is not sufficiently considered. When a machine is ordered in Germany, be it ever so unimportant, the buyer makes special demands. Nobody thinks of doing that in America. If it does occur in an exceptional case the special requirements must be well paid for. Mr. Riedler quotes the following example of his own experience: A large buyer came to the Corliss Engine Works and wanted some special points in re-

gard to the air pump of the engine ordered by him. He simply received the answer: "Do you want a Corliss engine or not? I build my engines in that way and in no other."

This system goes further in the whole manufacturing industry in America than appears on the surface. In many branches it makes it possible to specialize and to manufacture large quantities, which cannot be done in Germany. If an engine builder there undertook to arrange his manufacturing as Corliss does it would injure him, since customers would not submit to his standard design.

The manufacture of large quantities in America leads only to an extension of the manufacturing industry, but does not bring about higher technical quality. So far as quality is concerned, German manufacture is in no way inferior to that of America. Even in machine tools no difference in favor of the American can be discerned after the most careful investigation.

Professor Riedler goes even further. If in a country in the manufacture of machinery precise measurements are more general, this should be equivalent to greater accuracy and higher quality of work, and this effect should be shown in the general machinery trade. He states the following example from his own experience: During the last four years Professor Riedler had occasion repeatedly to engage in work connected with American machinery plant, which led him to understand matters more thoroughly than is usually possible. Among the machinery wanted was some in which the very highest accuracy was required. At the outstart the best and dearest maker was chosen, to whom a definite accuracy in the execution was specified. He was told so much tolerance is allowed. The measurements must be made in such a way, and what could not be expressed in figures was carried out in model. The machinery concern declared that it would fill these requirements, but asked \$8000 more. That was accepted. An inspector was sent to the works to superintend the manufacture and measure everything. This rule was accepted by the maker, but the inspection had to be paid for by the customer, and when the inspector interfered with the work the time lost was specially charged. The requirements made in this specific case did not go beyond the measures customary in Germany, so far as their leading engine makers are concerned. In America, however, they are by no means the rule.

In the general machinery manufacture, so far as it does not deal with the production of large numbers of one machine, work is less accurate than it is in Germany in spite of the uniform type. Bad work is done in America as well as in Germany. The general average must decide, and in that Professor Riedler claims to be able to name at least a dozen large works in Germany to whom he would give the execution of the most difficult machine without any control whatever, because the most accurate manufacture would be considered a matter of course, while he claims to be able to name only very few American works which he would trust in the same way.

The American machinery industry is not as developed as is often assumed. The workshop appliances in many branches have remained behind in an astonishing degree. They correspond on an average to the point reached nearly 15 years ago and only some special branches of manufacturing have advanced mightily. The ordinary found-

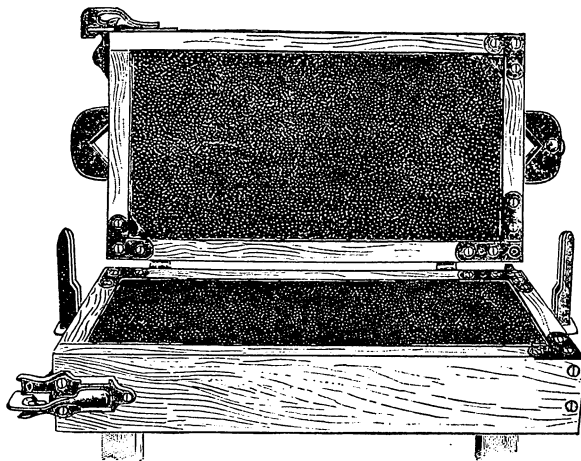
dries of machine shops are more than two decades behind the times. The same is true of a large number of boiler shops. The same slow rate of progress might be proven in metallurgy, in mining and in the textile industry. The truth is that the severe requirements which unfavorable circumstances bring about in Germany and which force them to attain high development by technical progress do not occur in America, since the utilization of the richer natural resources does not make it necessary.

Referring to electrical practice, Professor Riedler states that experts have convinced themselves that Americans have not gone so far ahead in the technical branch as has been asserted by many electricians. On the contrary, the technical development has remained behind. Imitation flourishes in America, particularly. Lately they have followed European models in the engines for central stations without having attained their high efficiency. In large central stations engines are found which in well developed German practice

that in the southeastern section of Philadelphia there are 5000 persons employed by the sweaters. Men and women are huddled together in a small, foul room, where they work from 12 to 18 hours a day. Often they throw the garments they are making upon the floor and sleep upon them. It is hard, he remarks, to reach these cases, for no contractor will employ more than four persons, and the law does not give the factory inspector authority to interfere with any one employing less than five. One room, however, may be rented by a dozen sub-contractors together. These rooms are crowded, their ventilation is execrable, and the entire surroundings are most miserable. A similar condition of things has been found in Pittsburgh.

The Diamond Snap Flask.

The Diamond Clamp & Flask Works of Richmond, Ind., manufacture a flask which is put together by templets so that the parts are interchangeable. The



THE DIAMOND SNAP FLASK.

would promptly be superseded by better ones. Direct coupled dynamos have only been built in the last three years. So far as the dynamos themselves are concerned some improvements have been carried through, but they have been executed in a pretty faulty way when compared with what German firms attain. The engines, however, are throughout extremely imperfect. At the exposition it was seen that American electricians built superannuated types and that now they are seeking for an engine corresponding to modern requirements, and in the search for it are making experiments which have been successfully solved in Germany six or seven years ago. Even the very best engines of the American central station which were represented in Chicago are inferior to the German and are particularly wanting so far as accuracy of work is concerned.

Factory Inspector Watchorn of Pennsylvania is introducing a bill in the State Legislature to compel all goods made in Philadelphia "sweat shops" to be plainly marked as such. This plan will, he thinks, deter reputable merchants from offering them for sale, and will gradually diminish the demand for such goods. The picture he draws of the sweat shops of the Quaker City and the sweating system as there carried out is instructive. He says

flask is operated in the same way as other snap flasks with these exceptions: Instead of unlatching one part at a time, in the ordinary way, both parts are unlatched at one operation. Closing the two parts latches them ready for another mold. The construction of the flask is clearly shown in the engraving.

The vice president of the Antwerp International Exposition has advised the United States Commission that 150,000 square feet of space has been reserved for the United States section. Shipments for this section from the Columbian Exposition have commenced to arrive in Antwerp. The exposition buildings, which were completed in October last, having been found entirely inadequate, annexes are now being built covering 300,000 square feet. The American building is reported to be in good progress, and will be completed by April 1.

The annual report of the Smoke Inspector of Cincinnati, Ohio, for the year 1893 shows that 595 devices of various designs were introduced during the year, and that as a result the smoke nuisance has been materially abated. The inspector believes that a much greater abatement would have resulted had the manufacturers purchased with a better understanding.

THE WEEK.

The "Cevic," the latest addition to the White Star Line of freight steamers, arrived in New York last week. The vessel is the finest of her class. She is 500 feet long, 60 feet beam and 34 feet deep. Her gross tonnage is 8302, and her carrying capacity is over 14,000 tons. The "Cevic," which was built and engined by Harland & Wolff of Belfast, Ireland, is specially designed for transatlantic freight carrying, and among other arrangements possesses facilities for the transport of 800 head of cattle on her upper deck. On the upper deck are seven horizontal steam winches, one to each hatch, and the devices for rapid handling of cargo are of the most complete description. Her twin screws are of manganese bronze. They are driven by two sets of triple expansion engines, the cylinders being 23½, 38½ and 64 inches in diameter respectively, with a stroke of 4 feet. The nominal horse-power is 708; indicated, 4000, and the speed over 13 knots.

The situation in the plate glass industry of the United States is reported to be very serious for the manufacturers. Most of the factories are closed, being unable to run on the former scale of wages, and prices are demoralized, while there is no market for the product. The makers claim that the present crisis is due to the proposed reduction of the duty on plate glass by the Wilson bill, which if carried into effect will bankrupt the factories.

A significant indication of reviving confidence and prosperity is seen in the reassuring reports of the condition of the dry goods trade throughout the country. The *Dry Goods Economist*, which has been making a canvass of all the large dealers, states that most gratifying reports have been received from every quarter. A large, healthy spring trade is looked for.

The Legislature of Utah has passed a resolution protesting against that portion of the Wilson bill which affects the duty on lead ore.

Orders have been issued by the Navy Department for lengthening the new United States gunboats "Castine" and "Machias," in accordance with the recommendations of the board of experts. The work will be carried out at the Norfolk Navy Yard.

To reduce the risk of fire at sea, the White Star Line will carry no more cotton on their transatlantic passenger steamers.

A suit has been brought in Washington by the officers of the Knights of Labor to enjoin Secretary Carlisle from selling bonds. The declared object of the organization is to compel the Treasury to "coin the seigniorage."

Nearly 7000 potters are idle in Trenton, N. J., owing to wage disputes.

The imports of hay into Great Britain from the United States were 101,132 tons in 1893, against 11,588 tons in 1892.

All the commercial organizations of New York City are forwarding petitions to the Legislature asking for the deepening of the Erie Canal, in order to increase its traffic and correspondingly reduce the cost of freight carriage thereon. It is pointed out that under existing circumstances the rates charged by the canal carriers are more than three times as high as those paid on the great

lakes; and are only a trifle less than the rates charged by the railroads paralleling the canal. By increasing the depth of water, in order to admit the navigation of heavier boats, it is claimed that these rates could be profitably lowered, and a large portion of the lake grain traffic which is at present diverted to the St. Lawrence route and ports other than New York would be passed to shipment through this State and city.

The 18 Danbury hat factories which had been closed for nine weeks in consequence of labor troubles were opened on Monday; 12 as independent shops and six under the auspices of the union.

A large number of riotous miners consisting of Huns, Slavs, Italians and Frenchmen, created a reign of terror in Allegheny County, Pa., on Saturday by burning and demolishing the works at several collieries, committing theft and arson in Bridgeville and the neighboring towns, and attacking the mine operators. A serious amount of damage was done and blood was spilled before the riot was quelled by force of arms.

In spite of the hard times more anthracite coal was mined and sold in 1893 than in any other year, while the average price obtained was higher than that of several years previous.

California's Midwinter Fair was opened to the public on Saturday. The paid admissions to the grounds on that day numbered 72,248.

The New York Rapid Transit Commissioners have approved a plan for an underground railroad in the city.

The snowfalls of the past week were productive of good in affording work for a large number of the unemployed in Eastern cities and towns.

The population of New York City, according to recent estimates of the Bureau of Vital Statistics, is now 1,929,376.

A marked revival of activity in real estate is reported in New York and Brooklyn. Several important purchases of city property have been consummated within the past week, and there has been a considerable increase in the number of plans for new buildings and alterations filed with the Building Department of both cities. Among the contracts for costly buildings to be erected in New York during the year is a \$1,000,000 structure up town for the United Presbyterian Society, and a number of other erections only a little less important.

S. Theodore Mertwage, naval attaché to the Russian Legation at Washington, has been visiting Pittsburgh to inspect the manufacture of gun projectiles. It is rumored that the Czar's Government is likely to place some heavy orders for naval supplies in this country before long.

The Transvaal gold mines produced 1,478,473 ounces of gold in 1893, as compared with 1,210,862 ounces in 1892 and 728,613 ounces in 1891. It looks as though the gold product for 1894 will reach \$35,000,000.

It has been decided by the committee appointed to settle the site of the French Exposition of 1900 that the great fair shall be held in Paris itself. It is to occupy the Champs de Mars, the Trocadero, the Esplanade des Invalides, the Quai D'Orsay, the Palace of Industry and the surrounding ground. A special bridge is to be constructed for the occasion over the Seine, the

main entrance to the exhibition being on the Place de la Concorde.

Persistent efforts are being made to encourage the cultivation of ramie in the United States, with a view to its use as a textile and for paper making material.

The *Silk Herald* of Paterson, N. J., says that among the thousands of people engaged in the silk industry, scattered through the United States, four-fifths are out of employment at the present time.

Brick manufacturers of New York, New Jersey and Long Island will, it is said, form a trust.

It is announced that the Bell Telephone Company will ask for an increase of their capital stock by \$20,000,000 or \$30,000,000, in order to meet the enormous growth and development of its business. The present capital of the company is \$20,000,000.

Several railroad companies announce a cut in the wages of their employees from February 1.

The dynamite cruiser "Vesuvius" sailed from the Brooklyn Navy Yard on Saturday to search for and destroy derelicts, and to report dangerous obstructions off the coast for marking and removal in the future.

Fire insurance companies have not experienced a profitable business of late years, and fire insurance stocks are, with but few exceptions, not regarded in the same favorable light by investors as was formerly the case. A statement printed by the *New York Journal of Commerce and Commercial Bulletin* shows that only 29 fire insurance companies are now on the stock list, whereas their number in 1879 was 80. The majority of these latter have in the interval terminated their existence through failure. And yet, with this great weeding out, the existing companies as a rule show a material shrinkage of profits as compared with their returns of 15 years ago. The enormous increase in the fire losses of the United States in recent years is, of course, mainly accountable for this state of affairs. Fire underwriters complain, however, that, as compared with those of other corporations, their tax charges of all kinds are entirely disproportionate and unduly heavy.

The United Collieries Company, a Western Pennsylvania corporation, have instructed their counsel to bring suit against the Pennsylvania Railroad Company for \$300,000 damages for alleged unjust discrimination in freight rates and for violating the Interstate Commerce law.

A decrease of \$11,370,074 of internal revenue is shown for the first half of the current fiscal year by an official table prepared in the office of the Revenue Commissioner in Washington. The principal items of shrinkage are tobacco, spirits and fermented liquors.

During 1893 the number of live cattle shipped from the United States to foreign countries was 241,827 head. From Canada 83,322 head were shipped, the total exports from the two countries being 325,149 head against 496,000 for 1892.

Congress has before it two bills to increase the enlisted strength of the navy. The action is rendered necessary by the requirements of several new vessels that are nearly ready to go into commission.

The Iron Age

New York Thursday, February 1, 1894.

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JOHN S. KING, - - BUSINESS MANAGER.

The Amendments to the Metal Schedule.

At the eleventh hour in the tariff debate the Ways and Means Committee has seen fit to propose and force through further reductions in the iron and steel schedule, which we enumerate elsewhere. From the statement made by Mr. Breckenridge of Arkansas, who led the committee in the House, it appears that the recent course of prices has encouraged the majority to cut down the duties even closer. From a hint thrown out by Mr. Wilson and from the direct admission of Mr. Breckenridge it is clear that the leading members of the Ways and Means Committee are seeking the revenue point on iron and steel. Mr. Breckenridge says: "This article (pig iron) should yield us some revenue." So far as we know this is the first direct acknowledgment of the fact that those who are now tinkering with the tariff deliberately intend to throw open to foreign competition a part of the American markets; that they want to encourage importations for the sake of revenue.

The position is taken that since prices are so very low now they should be kept down in the future. In other words, because a great industry has proven its ability to starve for a year, its rations must be kept down to the hunger point forever after. The misery of the American iron trade is used as an argument to inflict lasting harm. The needlessly desperate competition of the last few months is accepted as proving that, normally, values should be low. The reckless utterances of a few men inspired either by a boundless personal vanity or by crazy single tax theories, are used to brush aside the arguments of sincere and earnest manufacturers and workmen.

How thoroughly the real situation is misunderstood is evident from the following remarks made by Mr. Breckenridge: "Great as these reductions are, yet they leave a monopoly, though a greatly reduced monopoly, at all interior points and good profits at tide-water. But if you impose a duty that will enable any one of these concerns to command absolutely the market at the extremity of our continent it will be seen at once that an association could demand the most extortionate prices from persons adjacent to the mills, as well as impose high prices by reason of long and costly transportation upon our people

in distant parts." Could any argument be more extravagant than that which couples in one breath a recital of the fact that under present "high" duties prices in this country are close to European figures with the plea that a lowering of those duties will prevent monopoly? If a duty of \$6.72 on Bessemer pig had been so much neglected by monopolists that the metal is selling as low as \$12.75 in Eastern Pennsylvania, against \$10.25, the lowest touched in England, is a duty of 20 per cent., equal to \$2.05, going to be more efficacious in doing it? Lower the duties on soft steel billets from \$8.96 to \$3.82½, the equivalent of 22½ per cent., because unless you do some frightful monopoly will squeeze buyers, who now under the present duty are paying \$17.50 in Eastern Pennsylvania, against \$17 paid at English works!

It is contended by American iron manufacturers that it is highly unjust to base any adjustment of the tariff upon current panic prices, because they involve enormous losses to both labor and capital from the moment ore is raised from the ground until the finished product reaches the actual consumers. The iron industry cannot live and the workmen engaged in it cannot exist for a year on the present basis of values. They are willing to acknowledge that conditions have permanently changed in the direction of a lower basis of prices. But they emphatically protest against the assumption that current prices even proximately represent the figures at which the American iron manufacturers can enjoy moderate prosperity, develop the resources of this country, pay fair wages to workmen and pay fair rates of freight to the railroads and the lake fleet.

We have in the past looked without blinking at the facts in regard to the possible passage of the Wilson bill through both branches of Congress. It did look at one time as though the measure would, in a modified form, become a law. We believe now that the chances in that direction are very remote and that the bill will not now pass through the Senate.

We have repeatedly called attention to the fact that owing to present panic prices there is no chance of importations of foreign materials even if the bill should go through. In spite of this fact, of which buyers are fully apprised, they will remain timid and will withhold orders until the tariff discussion is out of the way. The sooner the verdict of disapproval comes the better for the business interests of this country.

When the tide does begin to turn and prices start on an upward course we expect to witness a remarkable revival of all sorts of schemes for combinations. The frightful depression has again proven that very few associations for maintaining prices amount to much on a declining market. Sometimes they are allowed to continue a

shadowy existence by courtesy, but they really possess strength only on a rising or stationary market. The sufferings of manufacturers have been and still are so keen that they will be likely to listen kindly to proposals which look to an amicable arrangement as to prices. After their recent experience they are not likely to commit the serious mistake which generally characterizes combinations, of endeavoring to take undue advantage of a temporary opportunity. They are not likely to key prices so high that outside competition is encouraged and a premium is set on outside treachery.

Western Building Prospects.

Western architects report a decided awakening in building projects. In some instances architects' offices are actually crowded with work, whereas only a short time since the prospects seemed decidedly unfavorable in the building line. There may not be many sky-scrapers among the new buildings on the boards in Chicago, but of less pretentious business structures and dwelling houses the number to be erected this spring will compare favorably with others seasons. In the smaller Western cities the same conditions are reported to exist, with here and there an enterprise of some magnitude for the locality. The building trades generally will be far from stagnant. The change to a fair degree of activity will be hailed with pleasure by all interests involved, comprising a very important part of the business energy of the country. The building trades suffered their full share of the consequences of the depression in business which set in so acutely last spring.

Ease in money and distrust of manufacturing and commercial ventures seem to be the factors which are potent in the revival of building activity. It is certainly not because there is an urgent demand for more houses. But real estate security has ever been deemed the safest basis for investment, and it is specially attractive now to those who fret because their idle money is steadily accumulating yet dare not risk it as they freely did up to the time of the panic. A lower rate of interest can consequently be secured by owners of building lots who desire to make improvements and have long awaited a desirable opportunity. This has come not only in a lowering of the rate of interest, but also in the heavy decline in the cost of building material and wages of workmen in the building trades.

The cost of building in the largest Western cities has of late years been unreasonably augmented by the extravagant demands of the workmen. Through their unions they not only advanced their wages almost beyond precedent, but also shortened their hours of daily toil, thus making the cost of building cumulative. The edge has been rather roughly removed from the sharpness of these conditions during the past six months. Workmen

who considered themselves quite poorly paid at \$4 per day of eight hours of but moderately skillful labor have been known to feel thankful in securing a job paying but \$10 per week, even if they were occasionally called upon to put in a 12-hour day. It is estimated that in the vicinity of Chicago, and perhaps the same is true of the West generally, the reduction in the cost of building as compared with 1892 and the early part of 1893 is about 40 per cent. The inducement to men of some means to make improvements which have long been contemplated is, therefore, seen to be quite strong.

As to speculative building, in anticipation of the wants of a home-loving people, it can be said that there never was a time more favorable than this for the consummation of building enterprises on a large scale. Cheap money, cheap material and reasonably paid labor form a combination not often seen in this country, and advantage should be taken of it when it does exist. Ere long the life-blood will again flow freely through the business arteries of the nation, the body politic will be reanimated with healthful vigor and the present languor will be succeeded by a rush of activity. It will then be found that our constantly expanding population will need more house room. Families that have been forced to huddle in a few rooms to reduce expenses will feel able to indulge in better quarters and will seek to secure them. Houses built this year will not be much, if any, in advance of the time when they will be needed.

The iron trade can take considerable encouragement from the conditions thus set forth. Activity in building, which is presaged by the news from the architects' offices, will mean a greatly increased consumption of iron and steel. Small business structures and even dwelling houses play a part in sustaining the iron trade, which is by no means insignificant. And, besides, every year sees greater improvements in building construction in which iron or steel is introduced more largely. Makers of structural material, particularly, have good reason to expect a marked growth in the use of their product in the erection of buildings of moderate size, as high prices, which were long claimed to be a barrier to the wide use of metal building shapes, are no longer in the way.

Elsewhere we print a few of the severely critical points relating to American practice in machine and engine building which are contained in an address by Professor Riedler of Berlin before a body in that city. This latest and frankest critic is altogether too eminent a man to have his verdict brushed aside with indifference or contempt. Professor Riedler has studied our methods and our products in other places than the World's Fair. He escapes the reproach that he has judged us from the very inadequate and incomplete display there. We do

not pretend to know what progress has been made in the last few years in Germany, but we do know that a number of eminent American engineers have personally investigated developments abroad. They should come forward now and let us have a straightforward account from their point of view. Professor Riedler seems inclined to believe that it is an evidence of a higher development when every buyer has his own notions of what he wants and insists upon getting it, and that, therefore, the American method of manufacturing large numbers of standard machines cannot be introduced in Germany. We believe, on the contrary, that a country is much better off when every buyer is not encouraged to paint the lily in his own particular hue. It is not an economical operation, and the sooner German manufacturers drive it into the heads of their customers the better for all concerned.

An effort is being made by owners of lake vessels to reduce the tonnage in active service during the season of 1894. An agreement is in circulation for signatures, proposing that each vessel shall remain out of commission at least one-quarter of the season of navigation, the owner to elect which part of the season his vessel shall remain idle. It must receive the approval of 90 per cent of the carriers to become operative. While it is hardly probable that this scheme to reduce competition will cause much of an advance in water rates over the lowest figures ruling last season, yet there is always a possibility that such combinations may for a time secure better than what would seem to be natural rates under existing circumstances. Iron and steel manufacturers who smelt Lake Superior ores are banking on low lake transportation during the coming season as one of the elements in securing cheap delivery of ores at their furnaces. This movement may, therefore, be of very great interest to them if it should result in an advance of 50 or even 25 cents per ton on the lake carriage.

The suspicion is growing rapidly that important concessions are being made by railroads in rates of freight to some of the large iron and steel manufacturers. It is well known that in some branches of the trade, when very large quantities are involved, special negotiations determine the rates of freight paid. The suspicion referred to is supported to some extent by the growing practice of some of the large producers of quoting only prices delivered to the consumer, the older and more general method of naming mill quotations having practically disappeared. Manufacturers not thus favored will do well to carefully investigate this question. Secret cuts in freights are supposed to account for some of the exceptionally low prices reported so frequently. The trade

learns, for instance, that steel billets have been sold at \$17.25, delivered at a point to which the open rate is \$2.25, and the inference is promptly drawn that the sale netted the steel works only \$15. Yet the seller may have secured a rate of \$1.75 and has thus actually not gone below \$15.50. The iron trade will do well to keep this point in mind when figuring back from delivered to mill prices.

A decision of the greatest importance to all those interested in any way in patents has just been handed down by Judge Ricks of the Circuit Court of the United States, Northern District of Ohio, Eastern Division. The motion of the Buckeye Electric Company to dissolve the injunction allowed against them July 28, 1893, in the suit of the Edison Electric Light Company for infringement of the Edison lamp patent was allowed. The contention was solely upon the legal effect, as between the parties to the suit, of the famous certificate of correction attached by the Patent Office to the Edison patent, upon the petition of Thomas A. Edison. This noted certain foreign patents for the same invention and requested that the Edison patent of January 29, 1880, be limited to expire with that foreign patent having the shortest time to run. This particular patent was the English one of November 10, 1879. It was contended in support of the motion to dissolve the injunction that by the procurement of such certificate Edison and his company were estopped from the enforcement of their patent after November 10, 1893, the life of the English patent being 14 years. Judge Ricks holds that the complainants' conduct and public declaration of the facts concerning their patent are binding upon them. The essential part of the decision is as follows: "Whether the Patent Office was authorized by law or not to make such official correction, the petitioners unquestionably have the legal power to voluntarily fix a limit upon the duration of their own patent." This opinion is far reaching, as it establishes, unless overthrown, an important precedent.

At Youngstown, Ohio, a movement is on foot looking to a combine in that district between the National Union of Iron and Steel Workers and the Amalgamated Association of Iron and Steel Workers. Two meetings have already been held at which this project was thoroughly discussed and another is expected to be held in a few days. In this movement the officials of the Amalgamated Association have not been recognized, the members acting individually. The Finishers' Union officials are willing to make the combine, as they believe it will strengthen their organization.

Schuebelite, the new French explosive, was satisfactorily tested near Paris a few days ago. It is reported as being powerful, cheap, safe and almost smokeless.

Washington News.

(From our Special Correspondent.)

WASHINGTON, D. C., January 30, 1894.

The vote on the pending amendments and on the final passage of the tariff bill under the amended rules regulating the parliamentary progress of the measure through the House having been set for 3 p.m. on Thursday, the intervening time is being devoted to the discussion of the internal revenue bill, which includes the income tax, as a rider to the tariff bill. Ex-Speaker Reed will make a masterly closing for the minority and Speaker Crisp and Chairman Wilson for the majority. On the income tax the majority are divided, but the minority will vote to incorporate it in the bill in hopes of making the measure as odious as possible in order to give the opposition wing of the majority an opportunity to defeat the whole measure if they have the courage of their convictions. The minority have decided not to support recommitment. Therefore those of the majority in favor of this method of at least temporarily disposing of the bill have abandoned their purpose. The minority will vote against the bill on its passage or will support a motion to strike out the enacting clause, which would place all the opponents of the measure fairly on record against the entire measure. On such a proposition, according to the present canvass, not over 35 of the majority, at the very outside, would unite with the minority. This would not foot up over 159, or just ten short of a majority.

That strength of the opposition, however is an outside figure. Toward the close of last week the majority anti-tariff and anti-income tax advocates confidently counted on 50, which would very likely have defeated the bill, but that number is not to be relied upon now. When recommitment was growing serious Chairman Wilson threatened that if the bill were recommitted it would be most likely to be reported back a straight out free trade measure. The minority, however, not wishing to embark in any piecemeal method of attack, determined not to co-operate in anything except the immediate defeat of the measure. The amendments to a number of items under the metal schedule and their prompt passage is a fair indication that the friends of the committee will stand by it, and that the bill will pass the House in the shape in which it was left at the close of the debate on Saturday. The following is the official enumeration of the iron and steel amendments proposed by the committee and incorporated in the bill:

	Per cent. ad valorem.
Iron in pig, iron kentledge, spiegeleisen, ferrosilicon.....	20
Wrought and cast scrap iron and scrap steel.....	10
But nothing shall be deemed scrap iron or scrap steel except waste or refuse iron or steel fit only to be re-manufactured.....	10
Ferromanganese.....	10
Iron in slabs, blooms, loops and other forms more advanced than pig and less than bars, instead of 25 per cent.	22½
Bar iron, rolled or hammered iron coils, rods, &c., instead of 30 per cent.	25
Beams, girders, &c., all other structural shapes, iron and steel, plain or punched and fitted for use, instead of 35 per cent.	30
Boiler or other plate iron or steel except saw plates, not thinner than No. 10 wire gauge, and skelp iron, &c., instead of 30 per cent.	25

Forgings of iron or steel in whatever stage, instead of 30 per cent.	25
Hoop, band or scroll iron or steel, instead of 30 per cent.	25
Railway bars, iron or steel, in part of steel, T rails and punched iron or steel flat rails, instead of 25 per cent.	20
The rest of the items in this portion of the schedule remain as in original bill.	
Wire rods, &c., or iron or steel nail rods, instead of 30 per cent.	25
Wire, iron or steel, &c., instead of 30 per cent.	35
Card clothing has been amended so as to read:	
“Card clothing made of leather and iron or steel wire, 25 per cent. ad valorem. All other card clothing, 35 per cent. ad valorem.	
Horseshoe nails, hob nails and all other wrought iron or steel nails not specially provided for, instead of 25 per cent.	30
Screws (wood screws), instead of 30 per cent.	35
Wheels, or parts, of iron and steel, &c., and steel tired wheels for railroad purpose, wholly or partly finished, &c., ingots, &c., for same, without regard to degree of manufacture, instead of 35 per cent.	30

Mr. Breckenridge of Arkansas, a member of the committee, said that after making pig iron 20 per cent. ad valorem instead of 22½ per cent., and scrap iron 10 per cent. the committee very much desired to put the latter on the free list, but owing to the rate they felt compelled to leave on pig iron they did not think it best to put scrap on the free list.

Mr. Johnson made an effort on three amendments to get the duty on steel rails at 5, 10 or 15 instead of 25 per cent. These amendments were voted down successively—the first, ayes 28, noes 123; the second, 39 to 120, and third, or 15 per cent., ayes 40, noes 142.

All the amendments to the metal schedule as above given were adopted. A canvass is now being made to ascertain if possible what strength can be relied upon against the bill with the internal revenue rider attached.

The Naval Ordnance Bureau and experts in both branches of the service are watching with great interest the progress of the 8 inch nickel steel naval gun. This is the first attempt at this class of ordnance, and if the new process of assembling is successful will completely revolutionize the method and simplify the mechanism of this most important part of gun making.

The furnace for heating the tube for the gun is the chief feature, being so constructed as to apply the heat to the gun in a horizontal position. The old process, the heat being applied to the gun in a vertical position, required enormous shrinking pits and the lifting of tremendous weights to great elevations in order to place the guns in position. It is explained at the Ordnance Office that the metal jacket at a high stage of heat will be forced over the base of the tube, while the latter is kept free from the expanding influence of the heat by a stream of water.

The scientific requirements of the operation will be under control through the use of a pyrometer adapted to the registering of the intense heat of the furnace.

The success in the use of nickel in armor plate has been fully established by the numerous tests which have taken place. The ordnance officers are convinced by scientific inquiry and investigation that the nickel steel gun will be the gun of the future, and will better perform the severe work imposed upon the modern high power gun.

The apparent snub to Senator McPherson of New Jersey, who was a member of the Senate Committee on Finance, in the substitution of Senator Mills of Texas, while the New Jersey Senator hurried off to Florida on the plea of ill health, is regarded among Senators who understand the inside working as a set up job to release Mr. McPherson, who is a candidate for re-election to the Senate, from the necessity of voting for the bill when it reaches that stage in the Senate.

The inference from all this is that Chairman Voorhees and his associates are playing a rôle to fool the manufacturers and wage workers, and when the time comes they will wheel into line for the bill with no material changes, and pass it if the minority do not obstruct.

The managers of the tariff in the Senate are still discussing among themselves the mode of procedure in the consideration of the House bill, which they expect will now reach them about Friday or Saturday of the present week. The circulars of inquiry, the details of which have already been printed in *The Iron Age*, are being distributed among the parties to receive them.

An effort is being made by the representatives of certain staple industries to secure hearings before the committee. It is not yet decided whether to grant them this opportunity, as the circular scheme is expected to answer all requirements. The experience in the House is not likely to be materially changed in the Senate. The manufacturers and wage workers must not lose sight of the dominant fact that the revision of the tariff on the lines laid down in the Wilson bill is an Administration measure, and will be respected as such by the majority in the Senate as it has been in the House.

The only hope in the Senate is that Senator Hill and his colleague, Mr. Murphy, who are now engaged in an anti-administrative controversy on a question of a confirmation, may conclude to carry their opposition to the extent of an attack on the tariff and may carry some strength with them.

The Representatives of iron manufacturing districts have received a large amount of valuable data bearing upon the various branches of that industry.

The outward cargo taken by the new White Star freighter "Cevic," on her return voyage this week, was of unprecedented proportions. It included 144,000 bushels of grain, 9000 bales of cotton, 800 head of cattle, 400 tons of copper and lead, 300 tons of fresh meat, 3500 sacks of flour, 3000 boxes of cheese, 2000 barrels of oil, 600 barrels of paraffine wax, 2000 bundles of sorted hides, 300 tierces of beef and 500 bales of hay.

The British War Minister, replying lately in the House of Commons to the question of a member, who asked how many more workmen would be needed in the Royal Arsenal at Woolwich on account of the reduction of working hours to 48 a week, said: "We shall not need another man. After making a comparative study of the results obtained in different departments, our conviction, confirmed by our experience, is that the relative augmentation of wages involved in this new arrangement will be counterbalanced by the savings which will be realized on fuel, light, oil, &c., by a diminution of waste, by the promotion of good will in the workmen, and by the suppression of the time hitherto allowed for breakfast."

Impressions of a Mechanical Engineer at the World's Fair.

From a paper read before the Technical Society of the Pacific Coast by Geo. W. Dickie of the Union Iron Works of San Francisco we take the following:

The one thing that impressed me most during the meetings of our section of this great Engineering Congress was the way in which the subjects treated of in the various papers would broaden out and assume dimensions under discussion far beyond the scope of the original paper. The ideas expressed in a paper produced in a British seaport, when discussed by a marine engineer or shipbuilder whose experience was limited to the practice on the great lakes or rivers of North America, had to meet conditions and be compared with results that were not only new, but in many cases very startling to the author.

One day during the discussion of a paper on river steamboat practice, I was endeavoring to point out the advantage of compounding stern wheel engines, recommending tandem compounds on each side, either condensing or non-condensing, when the author of the paper remarked that first cost was the most important consideration in the construction of a Western river steamboat; efficiency or durability being of secondary importance. "But," said I, "the every day expense of running must be an important matter, especially where transportation was effected so cheaply." "Why," said he, "I am afraid that the gentleman from the Pacific Coast has had but a small experience with Western river practice. As an example of economy let me give you an instance of a freight stern wheeler in my district that made her daily runs for the last season of eight months on a total expense of \$2.25 for fuel, and this expense was caused by the carelessness of the crew one night not securing wood enough for the next day's run, necessitating the captain's buying enough to last until dark, as his method of taking on fuel would not work in daylight. In this case what would be the advantage of compounding?"

We had not considered the subject from this standpoint, and had to admit that such conditions would not justify more expensive engines to save fuel.

The steam engine exhibits at Chicago confirmed an impression that for years has been forming in my mind, that the prime mover which has done so much for the advance of civilization and material wealth is not now held in the same veneration as in years gone by. Designers, builders and owners now treat the steam engine no better than they would a lathe, a planing machine, a loom, or a printing press. Democratic ideas at present prevail in mechanics, the declaration has gone forth that all machines are equal, and by right are free to perform their functions with the least possible expenditure of material carefully disposed in the direct lines of strain, no matter how offensive these unclothed skeletons may be to those who remember the time when the steam engine was the master machine, had a splendid house or palace for its own use, had a dignity of its own apart from and above the factory to which it imparted life and motion; and when its owner died or gave up business the great engine went as part of the land and buildings, and not as a mere manufacturer's implement.

I look in vain for some trace of the dignity of form and proportion and the grace of motion that characterized the factory engine of 20 years ago, the massive, finely molded case, the correctly proportioned columns and rich entablature, with the cylinder or cylinders so incased in polished mahogany as to be in harmony with the other statical parts of the structure, and all this, filled in with the artistic tracery of parallel motion and connections, making a complete machine that gave satisfaction to the soul of a true mechanic. With what is modern mechanical science, hampered by the all prevailing desire for something cheap to serve a present purpose, replacing these stately monuments of mechanical genius?

Here is what I found as the modern development of mechanical science. A square box called the high pressure cylinder, close behind it a larger square box called the low pressure cylinder, and usually a round box on top with a leg in each of the other boxes, called the receiver. Between these boxes, and the shaft journal, in the line of tension and compression strains, either steel rods or straight castings are fitted of just such form and dimensions as will resist the strains produced when the thing works.

Now, these lines may be perfectly correct and just the proper amount of material may be disposed around them, but I claim this to be an indecent exposure of the design. The disgusting nudity of these miserable machines is not the nude in art as we find it in the Art Building, but rather the naked skeletons of the anthropological exhibit. This setting up of the bones of a design as a finished result, denoting the presence of science without art in mechanics, produced on me a most painful impression, which deepened into actual shame that our profession had made such an unworthy exhibition of its own decadence.

I am often told that the useful only should be retained in any design. That is true, but who can say what is useful? Your best poet says:

"Nothing useless is or low,
Each thing in its place is best;
And what seems but idle show
Strengthens and supports the rest."

What would the beautiful building be that shelters these miserable mechanical skeletons without its clothing of staff? What hideous specters would have surrounded the Court of Honor if only the actually useful had been allowed a place? In regard to our other surroundings, we are not satisfied with the bare necessities of existence, and why should we be so in mechanics?

One of the conditions resulting from this utilitarianism is the sameness of design by all makers of certain types of engines. They could only be identified by the name plates and were entirely without character, and are to mechanical art what a chromo is to a painting.

This condition is very distressing when we come to follow these mechanical contrivances to the permanent positions they are to occupy in factories or power stations throughout the country. I must say, however, that in the various Eastern power stations that I visited the engine designs as a rule were far more satisfactory than those exhibited at Chicago. In giving you the general impressions produced on my mind by the steam engines exhibited, I must make one or two exceptions, notably a set of vertical engines for driving electric generators exhibited by a German firm, the satis-

factory proportions of which did much to relieve the distress produced by the American horizontals. It seems to me that the modern idea as to form in mechanics is limited to what a planing machine can produce in flats and a self-acting slide rest lathe can produce in rounds.

Before leaving the matter of engine design as displayed in the exhibits at Chicago, I desire to call attention to the prevailing indifference manifested by engine builders and those who employ them as to whether their designs are in keeping with their surroundings.

While East I visited a great many power stations, and in no case could I trace any relationship between the engines and the structures that sheltered them, in fact, as a rule, the designs were entirely opposed to each other. In one city I found a very pretty Gothic building sheltering a very ordinary horizontal pumping engine. The house was a thing of beauty, displaying true artistic skill in its design. The machine it sheltered was—well, I hope for the sake of my profession that it was bought in some machine junk shop, and not designed for the place it occupies.

In another city I was driven to the water works, and on seeing the buildings my hopes ran high, expecting for this once I would find that a master had been there. The engine house was a castellated structure of rough hewn stone in the baronial style, the water tower being incased in the same style of stone work with a castellated top like the engine house, and the bronze railings and gates, with their battle axe terminals, were all in keeping with each other. But with the architect all this unity of design ceased. Within I found two beam pumping engines, very well designed in themselves, but it just occurred to me that the owner of this Norman castle had gone down to Greece and stolen the engines out of some Ionic temple. Another set of engines in the same building were of the horizontal fly wheel type, without any character whatever. Evidently the first two sets of engines were special designs, and if the designer knew where they were going, and in what kind of a structure they were to pass their lives, why did he not design them so that they would be at home there? What a splendid opportunity to mount a beam on a Norman tower, supported on a rough hewn base, with loop holes for the foundation bolts!

The horizontal things had no business there at all, and as they were new, they only served to show how far we have fallen away from all appreciation of what is good in design.

PERSONAL.

Col. William P. Craighill of Baltimore is the first army officer who has occupied the presidency of the American Society of Civil Engineers.

Francis Collingwood of Elizabeth has been elected secretary of the American Society of Civil Engineers after a contest in which an unprecedented number of circulars were issued to members.

Col. H. G. Prout, editor of the *Railroad Gazette*, has sailed for Europe.

The Chicago Ship Building Company have taken a contract to build a steel steamer of 328 feet keel length, 44 feet beam and 38 feet depth of hold.

MANUFACTURING.

Iron and Steel.

The Mellert Foundry & Machine Company, Limited, of Reading, Pa., one of the oldest firms in the manufacture of cast iron pipe in Eastern Pennsylvania, have gone out of business, having sold all of their personal property, consisting of power, machinery, supplies, stock, &c., and leased all their ground and buildings to the Reading Foundry Company, who will conduct the business in the future. The company were established by John Mellert & Sons, in the spring of 1848, and in 1851 they commenced the manufacture of cast iron pipe. The Reading Foundry Company were organized October 31, 1884, and had completed and in operation by July 1, 1887, their present extensive pipe foundry. The business of both companies heretofore was conducted separately, though under one management, and as the maintenance of both organizations in this way brought about various complications and entailed extra and unnecessary expense it became desirable that it should be conducted by one company. At the recent annual meeting the board of managers was reduced from five to three, and Peter D. Wanner, A. H. Mellert and F. A. Knopp were elected to fill the positions. The board then reorganized and elected the following officers, who will manage the works in the future: Chairman, Peter D. Wanner; superintendent, A. H. Mellert; treasurer, F. A. Knopp; secretary, R. B. Kinsey.

The South Milwaukee Malleable Iron Works, whose works were partially destroyed by fire a short time since, contemplate rebuilding at Milwaukee, Wis. They claim that more railroad facilities were promised them at South Milwaukee when they originally decided to locate at that point.

At the annual meeting of the stockholders of the Glasgow Iron Company of Pottstown, Pa., the following officers were chosen: President, Comly B. Shoemaker; secretary, L. Fred. Nagle; treasurer, Richard W. Bailey; directors, Comly B. Shoemaker, Glasgow; Joseph L. Bailey, Pine Iron Works; Samuel A. Bacon, Haddonfield, N. J.; Benjamin H. Shoemaker, Philadelphia; Edgar S. Cook, Pottstown.

The Moline Malleable Iron Company are employing 125 men in their new works at St. Charles, Ill., and hope that they will be able to get up to their full force of 300 hands in the spring.

The Whitely Malleable Iron Company of Muncie, Ind., are using truck scales for handling castings, which are the invention of Superintendent Bert. Whitely. When the material is loaded on the truck to be moved it is thus also on the scales, which saves rehandling when the weight is to be ascertained.

The new Muncie Iron & Steel Company, at Muncie, Ind., have completed their plant and will shortly start up, employing about 150 hands.

The Indianapolis Bolt & Machine Works, at Indianapolis, Ind., are fairly busy with about two-thirds of the usual number of men employed. The works have recently received some large orders from railways for bolts.

The report sent out from Milwaukee that the Bay View works of the Illinois Steel Company are again shut down and may remain so for several weeks is not true.

James Blair of Scranton, Pa., has been visiting Pueblo, Col., and it is intimated that with a number of other capitalists he proposes to build a mill to roll merchant iron and some specialties, and perhaps steel rails.

The new 14-inch mill recently erected by the Gautier Steel Department of the Cambria Iron Company, at Johnstown, Pa., was put in operation last week.

The plant of the American Tube & Iron Company, at Middletown, Pa., which has been idle for about two months, has again been put in partial operation. Two furnaces in the butt mill and two in the lap mill have been started up. The output for the future is not as encouraging as it might be, but it is the intention of this concern to keep as many men employed as possible, and the departments recently started up will be kept in operation as long as orders warrant.

Last week five lap weld and three butt weld furnaces in the plant of the National

Tube Works Company, at McKeesport, Pa., were put in operation. Other departments of this plant will be started up as soon as orders warrant.

Sharon Furnace, at Sharon, Pa., idle for some months, was started up last week.

At the active blast furnaces in the Shenango Valley, Pa., notices have been given of a reduction in wages of about 10 per cent., to take effect on February 1. Commencing with the above date laborers will be paid \$1.05 per day, a reduction of 10 cents.

M. M. Garland, president of the Amalgamated Association, was in Belleville, Ill., last week and succeeded in arranging a wage scale for that plant. It is expected that operations will be resumed within a short time.

Moorhead Brother & Co., incorporated, of Pittsburgh, operating the Vesuvius Iron & Nail Works at Sharpsburg, Pa., have notified their employees of a reduction in wages of about 15 per cent. The puddlers will be reduced from \$4 to \$3.25 per ton. The above plant is now idle, but is expected to resume operations within a few days.

At a directors' meeting held at New Glasgow, N. S., three of the directors who were elected when the company was organized two years ago, resigned—namely, W. B. Moore, Alfred Markham and David Grant. The following gentlemen now compose the board: J. D. McGregor, New Glasgow, president; A. C. McDonald, Pictou, secretary-treasurer; J. B. Forster, Dorchester, J. N. W. Winslow, Woodstock and M. H. Fitzpatrick, New Glasgow, directors. E. A. Sjostedt, the active manager of the company, will at once put kilns into operation, and as soon as a supply of charcoal is stored the blast furnace at Bridgeville will be started.

The 14-inch train at the Albany Iron Works, Troy, N. Y., ran all last week, and the Belgian train was started up Thursday. The 14-inch and 20-inch trains at the Burden Iron Works will soon be started, it is expected.

The plant of the Rome Cotton Tie Mfg. Company, at Rome, Ga., has been sold at receiver's sale to Harper Hamilton for \$2790. It was built in 1889, and its annual capacity, single turn, is rated at 3000 net tons of bar, band and hoop iron and cotton ties. Its valuation is variously estimated at from \$30,000 to \$60,000. The purchaser says he does not know what disposition will be made of the property.

The New Haven Rolling Mill, at New Haven, Conn., has started up with a full force of 125 men after a shut down of four weeks. It is stated that the company have received orders sufficient to keep them busy all winter.

Lebanon Valley Furnace, at Lebanon, Pa., which went out of blast recently for repairs, has resumed.

Hinkle Furnace of the Ashland Iron & Steel Company, at Ashland, Wis., has blown out. It is said to be the intention of the company to let the furnace remain idle for four months.

The Williamson Iron Company of Birmingham, Ala., have gone into the hands of a receiver, in the person of C. P. Williamson, president of the company. The bill filed in equity by the petitioners, the Williamson Iron Works, states that the Williamson Iron Works are a corporation of \$150,000 capital. They first operated only a foundry and machine shop, but later on built a blast furnace. To do this the company floated \$60,000 of bonds and gave a mortgage to the trustees mentioned. The foundry and machine shop have made money and are now in operation. The company owe the First National Bank and the Sloss Iron & Steel Company about \$82,000.

Fort Payne, Ala., one of the pioneer boom towns of the South, has been sold at public outcry to E. N. Cullom of Birmingham, for \$60,000. The purchase includes 30,000 acres of mineral lands, 2000 town lots and various industries, including the rolling mill and furnace of the Fort Payne Coal & Iron Company. It is said that the private and corporate expenditures amounted to \$5,000,000, and that the expenditures of the Fort Payne Coal & Iron Company alone amounted to \$2,000,000. All of the property has been sold for \$60,000. The town was founded by New England capital in 1889.

The resumption of operations at the Belleville Steel Works, Belleville, Ill., will probably lead to the blowing in of one of the stacks of the Missouri Furnace Com-

pany, who supply the Belleville plant with pig iron.

Schaw, Ingram, Batchelor & Co. of Sacramento, Cal., have just completed a building, 42 x 100 feet, which they have equipped with modern machinery for the manufacture of sheet iron and steel pipe for mining, irrigating and power purposes. After the pipe is riveted together in sections, as desired, it is then immersed in a hot bath containing a special mixture of asphaltum, pitch and petroleum.

The Spang Steel & Iron Company of Pittsburgh, with works at Etna, Pa., have enough orders on hand to enable them to operate their mills for two weeks, and have given notice that 200 men will be put to work during this week, including the salaried men who were laid off on January 1.

We are officially advised that the report that the Cambria Iron Company, Johnstown, Pa., had purchased the Hogg farm, west of Connellsville, Pa., and would erect a \$5,000,000 steel plant on it, is utterly untrue.

Under date of January 27 we have advised from the Ohio Steel Company, Youngstown, Ohio, as follows: "We have recently perfected the plans and made the contracts for the finishing departments of our steel plant, which consists of two 40 x 60 inch simple engines and one 46 x 60 inch simple engine, the contract for which went to William Tod & Co. of Youngstown, Ohio, the engines to be finished within four or five months. The contract for the three finishing mills went to the Robinson-Rea Mfg. Company of Pittsburgh, these mills to weigh about 550 tons and to be delivered in three months. The tables for operating these mills have been contracted for with the Lloyd Booth Company of Youngstown, Ohio, their total weight being about 250 tons, and are to be delivered within three months. The contract for the pit furnace building, the finishing mill building and the building for hot beds and hot saws was awarded to the Youngstown Bridge Company of Youngstown, Ohio. These buildings cover an average area of about 90 x 750 feet and will weigh over 800 tons, the same to be completed within three months. The above, together with several large steam and hydraulic shears, some additional tables and ingot extractor, with a building for the same, and several small engines, &c., will embrace substantially all that remains to be contracted for the completion of our Bestemer steel plant. In this plant we shall operate about 15 electric motors. The converting capacity of the plant will be from 1000 to 1400 tons per day. The finishing capacity in billets, sheet plates and bars and structural material will be from 1000 to 1200 tons daily. We contemplate the completion of this plant with a view to rolling T-rails, and the capacity of the mill for that purpose is thought to be about 2000 tons daily."

The annual meeting of the directors of the Thomas Iron Company, Catsasauqua, Pa., was held at Easton, Pa., on Friday, the 26th ult., at which a semi-annual dividend of 3 per cent., payable on February 1, was declared. The limited charter of the Thomas Iron Company will expire on April 4, and a movement is on foot to obtain the consent of a majority of the stockholders, who must waive any rights conferred upon the company by its charter which are not enjoyed by similar corporations under the Corporation act of April 29, 1874, and its supplements, or by any general laws; they must also accept the provisions of the Constitution of this State, and of the act of General Assembly of April 29, 1874. The company were originally chartered on April 4, 1854. In 1874, on April 4, they were rechartered for a term of 20 years. It is now proposed to have a perpetual charter obtained on April 4 next. The company, under the terms of a new charter, will lose many rights and privileges allowed under the provisions of the old charter. At present but four of the 11 stacks of the Thomas Iron Company are in blast, three of these being at Hokendauqua and one at Alburtis. As yet it is very uncertain when additional stacks will be fired up. The one at Hellertown is undergoing extensive repairs, while No. 1, at Hokendauqua is being rebuilt and considerably enlarged.

The United States Iron & Tin Plate Mfg. Company, Demmler, Pa., manufacturers of tin andterne plate, are operating their plant to full capacity and are disposing of their product about as fast as made. Users of tin andterne plate made by this concern have advised them that their product is fully equal to the imported article, and in

some respects is much superior. Right through the long period of business depression the above concern have been able, by reason of demand of their customers, to keep their tin plate plant in operation to nearly full capacity.

Tod Furnace of the Youngstown Steel Company, Youngstown, Ohio, which has been banked for some time, has been started up again and is running very satisfactorily.

It is stated that plans have been perfected for the reorganization of the Southern Iron Company of Nashville, Tenn., who assigned last August, under the name of the Central Iron Company. The property will be sold at Huntsville, Ala., February 20, by the Central Trust Company of New York, for the defaulted interest. It will be purchased by the owners of the securities. The new company have already been chartered under the laws of Alabama. The stock and bond issue will be cut from \$7,000,000 to \$5,000,000. The company own seven furnaces in Tennessee and Alabama, and about 150,000 acres of valuable ore and timberlands.

The Ohio Iron & Steel Company of Lowellville, Ohio, announce that they have made arrangements with Arthur W. Howe, 615 Drexel Building, Philadelphia, Pa., for the sale in the Eastern Pennsylvania market of their well known Mary Ohio Scotch foundry iron.

The puddle mill of the Glasgow Iron Company, Pottstown, Pa., which has been idle for some months, has resumed operations, employing about 100 men.

Machinery.

F. S. Lovell's machine shop, at Fitchburg, Mass., has been burned, at a loss of \$5000; insured.

The creditors of the Indianapolis Car & Mfg. Company of Indianapolis, Ind., have been awarded a dividend of 3.1 per cent. by the United States Court.

William Stormont of Ottawa, Ill., whose foundry was burned last year, has purchased a large piece of ground and proposes to build an extensive machine shop and foundry in the spring.

On the 22d ult. Thomas Gillespie, receiver of the Chicago Foundry Company, was ordered by Judge McConnell to accept \$23,000, the bid made by S. M. Millard, for the company's property, at South Chicago, as a going concern. A \$5000 cash payment will be made by the purchaser, and notes given for the balance, secured by a deed of trust to the Chicago Title & Trust Company on the property of the company.

The Chandler & Taylor Company, at Indianapolis, Ind., are working a full force in their boiler shops on full time, while in the machine shops not more than one-third of the usual number of men are at work.

The Norwalk Foundry & Machine Company of Norwalk, Ohio, are erecting an additional building, to be of brick, 100 x 50 feet, one story high. It will make an important enlargement of the company's manufacturing facilities.

Thè Lodge & Davis Machine Tool Company of Cincinnati, Ohio, have received an order from the United States Government for machine tools to be used at the Mare Island Navy Yard.

W. T. Barnes of Lake Geneva, Wis., has sold his boiler works to John Haxton, late of Elgin, Ill., who has secured a larger building in which to carry on the business.

The Bristol Company of Waterbury, Conn., is the new name of the concern formerly known as the Bristols' Mfg. Company. The new company continue the business of manufacturing steel belt lacing and recording pressure gauges and voltmeters. In spite of dull times the business has continually increased.

In the courts at Pittsburgh last week a bill in equity was filed by the Taylor Wire Nail Machine Company against Wm. Taylor and Frederick R. Diehl. Taylor, it is stated, is the inventor of a number of improvements in the manufacture of nails and rivets, which the company bought from him and made him general manager of a works. The assignments of the patents contain errors, it is charged, and some were not complete assignments, as had been agreed upon. Taylor has since sold some of these patents to other parties, including Diehl, and is trying to sell more. The company want him restrained from doing so and

compelled to give them a complete assignment of the patents.

The Pennsylvania Diamond Drill & Mfg. Company of Birdsboro, Pa., recently received an order from Calcutta, India, for two No. 7 prospecting diamond drilling outfits, which will be built and shipped as soon as completed.

The Hercules Ice Machine Company of Aurora, Ill., report trade fairly brisk with them in their line of special tools, consisting of their single and double, upright and horizontal, forging and bending machines, eye bolt machines, 10 to 20 pound light hammers and riveters; they have also just begun the manufacture of a special tool for upsetting the shin of plow mold boards.

The Cincinnati Milling Machine Company, Cincinnati, Ohio, are again operating their plant with the full quota of hands and on full time. Among recent orders received was one for eight of their large size milling machines to a large Eastern manufacturing concern, while the company are now busily engaged in filling numerous smaller orders for both milling and grinding machines, of which they make a specialty.

William B. Turner's foundry, at Bellevue, near Schenectady, N. Y., will be opened and running early in the spring.

The Standard Emery Wheel Company of Albany, N. Y., have been running on full time with a complete force since the middle of December and will probably be compelled to increase the number of their employees within a week or two.

Lambert Bros. & Co., machinists and boilermakers, of Ironton, Ohio, have reduced the wages of their employees 10 per cent. A reduction of 20 per cent. was at first declared, but the men refusing these terms a compromise was effected.

The Bridge & Beach Mfg. Company (Empire Stove Works), at St. Louis, Mo., will erect a new foundry building, 50 x 225 feet in size, and seven stories high. The company have had a most successful year.

The Sioux City Engine Works of Sioux City, Iowa, will probably be reorganized during the next 60 days, and the company put in shape to do a large business during the current year.

The Philadelphia Engineering Works, Limited, of Philadelphia, Pa., have just completed a 1000 horse-power horizontal cross compound condensing engine for the Hudson Electric Light Company's station, at Hoboken, N. J. In addition to this the plant is equipped with two of their vertical cross compound condensing engines, the aggregate power being \$500 horse-power.

Geo. W. Lord, manufacturer of Lord's boiler compound, 316 Union street, Philadelphia, Pa., has recently placed in his mill new and improved machinery by which the capacity of the plant is increased one carload of compound per day. A carload of compound recently shipped to Chicago was prepared and turned out ready for shipment in eight hours by the additional capacity mentioned.

At Birmingham, Ala., a receiver has been appointed for the Birmingham Iron Works, manufacturers of castings and machinery. The bill recites that the defendant company executed to Jos. F. Johnston, trustee, a mortgage and issued \$60,000 of bonds. These bonds are unpaid, and interest is in default since last October. The bill prays for the appointment of a receiver and the sale of the property. William Hardie, present manager of the company's plant, was appointed receiver, and he will continue the operation of the works without interruption.

Announcement is made that Henry C. Ayer, of the late firm of Pedrick & Ayer, of Philadelphia, has associated himself as general manager with the Henry C. Ayer & Gleason Company, a new concern, with office and works at Second and Diamond streets, Philadelphia, and an uptown office in the Betz Building in that city. The new concern will do a general machine business, paying especial attention to repairs to Corliss and other steam engines. They will in the near future equip themselves with a line of improved portable cylinder boring machines, for the purpose of re-boring cylinders in their present positions. They will also make a specialty of the manufacture of machinery, machine tools and special tools for railway repair shops. In connection with the foregoing Henry C. Ayer announces that he has sold out all right, title

and interest in the firm of H. B. Underwood, operating the L. B. Flanders Machine Works, Philadelphia, and that he has no connection whatever with same. He also announces that he has sold out his right, title and interest in the firm of Pedrick & Ayer, and that he has no connection with the newly incorporated Pedrick & Ayer Company.

The works of the Fitchburg Steam Engine Company of Fitchburg, Mass., have been running full time and full handed up to January 1.

The Totten & Hogg Iron & Steel Foundry Company, Pittsburgh, Pa., manufacturers of chilled and sand rolls and rolling mill machinery, have a considerable number of orders on hand, and are operating their entire plant to nearly full capacity. Since the establishment of the tin plate industry in this country they have supplied rolls to a large number of concerns engaged in the new industry, and have just received an order from Marshall Brothers & Co., Philadelphia, Pa., for a pair of chilled rolls 24 x 32 inches in size, and are also remodeling to some extent the plant of the American Tin Plate Company, at Elwood, Ind. They are also rebuilding a large rolling mill engine for the Lockhart Iron & Steel Company of Chartiers, Pittsburgh, Pa., which includes fitting it up with Freeman valves and Aetna cylinder, and have a number of other orders on hand.

Philip Rohan of the Rohan-Cook Filter Company, St. Louis, was in Pittsburgh recently for the purpose of organizing a company to engage in the manufacture of filters in the latter named city on a large scale. It is stated that the proposition of Mr. Rohan was well received, and that quite a number of capitalists of Pittsburgh have signified their intention of subscribing liberally to the proposed capital of \$1,000,000. As soon as \$200,000 worth of stock has been subscribed for it is proposed to at once take up the question of selecting a site and determining the size of the buildings to be erected.

The Pratt & Whitney Company of Hartford, Conn., have opened a branch office at 136-138 Liberty street, New York, where they will keep a full line of the small tools made by them.

During the first two weeks in January the plant of the Acme Machinery Company, Cleveland, Ohio, manufacturers of bolt, nut and special machinery, was closed down for inventory and repairs. On the 15th ult. the plant resumed operations again, giving employment to about 50 men.

We are advised that the statement that Wm. Tod & Co., Youngstown, Ohio, had put all hands to work in their foundry and that the machine shops would soon be in full operation is without foundation. While this firm have a considerable number of orders on hand, they have not sufficient work to warrant them starting up their foundry and machine shops to full capacity.

We are advised that the statement that the Lloyd Booth Company, proprietors of the Falcon Foundry & Machine Works of Youngstown, Ohio, would put all hands at work on a contract lately received from the Ohio Steel Company of that place is not altogether correct. While it is true that the above firm have received a contract for a little over 600 feet of tables for the blooming mill of the Ohio Steel Company, yet that amount of work, with what other work the firm have on hand, will not afford the concern the means of giving employment to their full force of men.

The Vilter Mfg. Company, formerly the Weisel & Vilter Mfg. Company, manufacturers of refrigerating and ice making machinery and Corliss engines at Milwaukee, Wis., report the outlook in their line of business as much more favorable than for some time past. They are now erecting and have in course of construction several large refrigerating machine plants and are figuring on a good deal of work, some of which is likely to be contracted for within the near future. The company state that they are now manufacturing their ammonia compressors, such as they use with their refrigerating and ice making plants of an improved pattern, heavier and more compact than in the old frame.

It is stated that the Pond Machine Tool Works of Plainfield, N. J., have received a Government contract that will keep the works in full operation for many months to come.

Hardware.

The Silver Plate Cutlery Company, Shelton, Conn., started up their works on the 24th ult. with a full complement of hands, and will for the present at least run on a nine-hour schedule. While the outlook is not as bright as might be desired an attempt will be made to run the factory on this basis.

The employees of the Stanley Rule & Level Company, New Britain, Conn., have signed a petition to the company for permission to work five days per week at eight and one-half hours a day instead of six days at seven hours a day. It is believed that the company will be willing to grant the request, as there is a difference of only one half hour in the week and the work can be done to as good advantage as on the present basis.

At the annual meeting of the Bridgeport Brass Company, Bridgeport, Conn., held on the 25th ult., the following Board of Directors was selected for the ensuing year: Charles M. Mitchell, Charles A. Hamilton, George E. Somers, Daniel W. Kissam, Nelson M. Beach, Charles X. Cordier and David B. Hamilton. Subsequently the directors elected the following officers: Charles M. Mitchell, president; George E. Somers, vice-president; Charles A. Hamilton, treasurer, and Nelson M. Beach, secretary.

Rogers Cutlery Company, Hartford, Conn., have elected William H. Watrous president, treasurer and manager, and George W. Watrous, secretary, for the ensuing year. The directors of the company are: William H. Watrous, George W. Watrous, D. B. Hamilton and George H. Wilcox.

The Albany Horse Nail Company, Albany, N. Y., will, it is reported, be shortly dissolved. The directors of the company having made application for the appointment of a receiver, Henry L. Smith has been selected to fill that office. Mr. Smith states that the company are absolutely solvent. The machinery and facilities of the company are of the best, and are said to have cost over \$100,000.

A factory for the manufacture of shovels, bolts and nuts is a new industry to be established at Philipsburg, Pa. The contracts for the necessary buildings and machinery have already been placed.

The annual stockholders' meeting of the National Screw & Tack Company, Cleveland, Ohio, was held on the 18th ult., the following directors being elected: W. D. B. Alexander, D. Elliott, J. K. Brainerd, D. C. Griesse, F. L. Gegelein and T. F. Beidler. The officers for the ensuing year are: W. D. B. Alexander, president; D. Elliott, vice-president and general manager; D. Auld, Jr., treasurer, and C. W. Brainerd, secretary.

The American Axe & Tool Company, East Douglass, Mass., are rapidly erecting two large iron shops to take the place of the shop which was burned the latter part of October last. The new shops are entirely fire proof, and are splendidly adapted for forging purposes. It is expected that work in the new shops will begin during the month of March.

A meeting of the stockholders of the American Wringer Company was held at Woonsocket, R. I., on the 23d ult., at which Joseph Banigan was re-elected president, George Reuter, Jr., treasurer and general manager, and Walter S. Ballou, secretary. The annual report of the treasurer showed the net earnings for the year 1893 to have been \$202,011.37; dividends paid, \$95,750; leaving a surplus of \$106,261.37 for the year, with a total surplus of \$238,860.63.

The plant of the Union Metallic Cartridge Company, Bridgeport, Conn., was damaged by fire on the 23d ult. The loss is estimated at about \$10,000, fully covered by insurance. The origin of the fire is not definitely known, but it is supposed to have been occasioned by spontaneous combustion.

A meeting of the stockholders of the Birmingham Brass Company, Birmingham, Conn., was held at the 24th ult., the following directors being elected for 1894: Mrs. Jane B. Cheeseman, D. L. Durand, G. O. Schneller, J. O. Blumm and J. B. Underwood.

Spencer Wire Company, Spencer, Mass., are running full time with a full force of employees.

The Springfield File Company, Springfield, Mass., have changed hands, the plant having been purchased by C. Roberts of Holyoke. There is some probability of the company's locating in Chicopee this spring.

W. F. Rockwell, formerly secretary, has been elected president of the Miller Bros. Cutlery Company, Meriden, Conn.

The Consolidated Barb Wire Company of Lawrence, Kan., have received the machinery for their new wire nail plant and will begin the manufacture of wire nails as soon as it can be installed.

A. F. Risser & Co., 80 and 82 Wabash avenue, Chicago, have prepared plans for a large saddlery hardware factory, to be erected on the west side of the city, occupying a block, extending from Polk to Ewing streets and 240 feet deep. It is to be seven stories high, and will be built of red pressed brick, with terra cotta trimmings.

The American Currycomb Works at Troy, N. Y., were slightly damaged by fire January 23. The fire is supposed to have originated from a spark from the furnace of the Delee spring factory, under the currycomb works.

The Salem Wire Nail Company, Salem, Ohio, have decided on another 10 per cent. reduction in the wages of their employees.

Shultz Belting Company, St. Louis, Mo., have just received an order from England for 2800 feet of belting and another from Russia for 15,000 feet. They advise us that trade is looking brighter and that orders are coming in freely.

Though business in hardware is generally dull in Boston a few large contracts have lately been placed. Burditt & Williams, who have the distinction of being the oldest hardware firm in the city, have recently secured two large contracts over severe competition. One was for the supply of several thousand dollars' worth of carpenters' tools to the Mechanic Arts High School. The other, which will amount to \$10,000 or \$12,000, is for the hardware trimmings for the new buildings of the McLean Insane Asylum, about to be removed from Somerville to Waverly, Mass.

The Star Baker Company, Belleville, Ohio, have completed a new building 30 x 40 feet in size, two stories high, especially adapted to the requirements of manufacturing roasters and bakers. The entire building will be used for the manufacture of the Columbia roaster and baker exclusively. We are advised that their increased facilities will enable them to make especially low prices on the goods.

The Portland Tinware Company, Portland, Maine, held their first annual meeting on January 16, at which L. W. Bradstreet was elected president, and J. W. Davis treasurer. The company report that the year's business was a satisfactory one. They employ from 15 to 20 hands.

The Cleveland factory of the Columbia Spring Company has resumed operations, giving employment to between 100 and 150 men. The factory has been closed since last July. The company's mills at Canton, Ohio; Cincinnati, St. Louis, Hammond, Ind.; Fort Plain, N. Y., and Bridgeport, Conn., are also running.

The Pike Mfg. Company, Pike Station, N. H., report an increased demand for their goods since January 1, and are receiving a liberal amount of orders, especially for their Lily White brand of Washita and their well known brands of Eastern scythe stones. They state that they are running their various factories with a somewhat increased force.

E. C. Stearns & Co., Syracuse, N. Y., advise us that the bicycle department of their plant is doing a most gratifying business. Their output is now very largely sold, and they refer to the prospects for the Stearns wheel as very bright.

Application was made on the 26th ult., at Harrisburg, Pa., for the incorporation of the Pedrick & Ayer Company of Philadelphia, a company formed for the purpose of taking over the business of the firm of Pedrick & Ayer, lately dissolved. The applicants for a charter are Daniel W. Pedrick, Eugene L. Manning, Charles A. More, Julius B. Price, Jr., and Charles G. Mayhew.

The Lockport, N. Y., Indurated Fiber Company expect soon to increase their force of employees by 100 additional men. This is due to the closing of the branch works of the company at Portland, Maine.

The Knapp & Cowles Mfg. Company, Bridgeport, Conn., manufacturers of a line of standard hardware specialties, have recently purchased the business of the Glines & Holmes Mfg. Company, California Tire Upsetter Company and Nilson & Sons, located in the same city. The acquisition of these concerns adds to the business of the

Knapp & Cowles Mfg. Company several specialties, including the California tire upsetter, tire bender and hacksaw frame, recently illustrated in *The Iron Age*, and the manufacture of piano and organ hardware heretofore carried on by Nilson & Sons. All these have been consolidated under one roof and one management, which, it is claimed, will effect a great saving in expense and be a convenience to patrons.

The copartnership formerly existing under the style of Graham, Passmore & Co., Philadelphia, has been dissolved by mutual consent and either partner will sign in liquidation. The business of the firm will be hereafter carried on by the Philadelphia Lawn Mower Company, at 3107 and 3109 Chestnut street.

Miscellaneous.

The long continued legal contest at Dowagiac, Mich., in which the Dowagiac Mfg. Company have been involved, was satisfactorily adjusted on the 12th ult., Henry Kummerle having sold all his stock to the Lyle Brothers, who already held a controlling interest in the company. The shops will be started up in a few days with a large force of men. The company are large manufacturers of agricultural implements.

The new works of the Stanley Electric Mfg. Company, at Pittsfield, Mass., will be built entirely of iron, designed and built by the Berlin Iron Bridge Company of East Berlin, Conn.

The twelfth annual meeting of the stockholders of the Cambridge Roofing Company, Cambridge, Ohio, was held January 6, attendance being full. Considering the extraordinary conditions of the past year a satisfactory report was presented. The old Board of Directors was re-elected, with A. W. Nicholson as president and S. W. Nicholson as secretary and treasurer. W. C. Cowgill will continue to represent this company on the road. The Chattanooga branch manufactory of this company is now owned and operated by the Chattanooga Steel Roofing Company, Chattanooga, Tenn., under the general management of J. E. Annis, formerly of Cambridge, Ohio.

The Steel Motor & Electrical Mfg. Supply Company of Cleveland, Ohio, would locate their works at Middletown, N. Y., if that city would give them a bonus of \$100,000. The company claim to have that amount invested in plant at Cleveland, but desire to increase their facilities and secure a location more accessible to Eastern trade.

The Otis Elevator Works of Yonkers, N. Y., have 425 men at work, while in the electrical works there are 75 more men at work at the present time. They have made no reduction in wages, but the men have been working only five days a week for six months.

The committee appointed by the creditors of the Gilbert Car Works of Green Island, N. Y., report that all but a few of the creditors have signed the common agreement which has for its aim the reorganization of the Gilbert Car Works Company. The claims of those who have not signed do not amount to more than \$10,000, and it is thought that the agreement will soon be unanimously favored.

The King Bridge Company, Cleveland, Ohio, have just finished the construction of a new riveting shop. It is built of stone foundation, brick walls and steel roof trusses supporting a slate and gravel roof. The building is 200 x 320 feet in size.

The firm name of William Deering & Co. of Chicago will be changed to the Deering Harvester Company, and the capital stock increased from \$2,500,000 to \$3,000,000.

The Pittsburgh Brass Company of Pittsburgh went into the hands of a receiver last week. It is announced that the assets of the concern are about \$400,000, and the liabilities about \$175,000. The bill asking for the receiver was filed by William Hartly of Ontario, Can., a stockholder to the amount of \$10,000, through his attorneys, W. B. Rodgers of Pittsburgh and L. W. Barringer of New York. The bill stated that the company, by reason of a remarkable increase in their business, were compelled to make large improvements, entailing heavy expenditures. When the business depression came on payments due for the work could not be made owing to the decrease in orders. An execution has already been issued for \$25,000, and to prevent a waste of the assets a receiver was desired.

At the annual meeting of the Akron Belting Company of Akron, Ohio, the following were re-elected members of the Board of

Directors and officers for the ensuing year: Directors: Geo. W. Crouse, A. M. Barber, Sumner Nash, Webster Thorp, O. D. Childs, Samuel Findley and A. B. Rinehart. The directors organized by electing Geo. W. Crouse, president; A. M. Barber, vice-president; A. B. Rinehart, general manager; Sumner Nash, secretary and treasurer, and Webster Thorp, superintendent. The company state that notwithstanding the business depression of 1893 it was the best year's business they ever enjoyed, as their factory was running on full time throughout the year and the sales were \$35,000 in excess of 1892.

At present there are only 34 men employed in the shops of the Brooks Locomotive Works of Dunkirk, N. Y., where usually 1500 are employed.

The court has overruled the motion to set aside the sale of the Vienna Enamel & Stamping Works, at Porter, Ind., to A. J. Johnson of Chicago, on the charge of fraud. The sale was confirmed at \$38,000, and a deed made to Gustav Wilkie of Chicago, who will open the plant about March 1. The property cost over \$100,000.

The National Switch & Signal Company of Easton, Pa., will, it is stated, resume operations at an early date.

The Clinton H. Menely Bell Company of West Troy, N. Y., have elected: Directors, Clinton H. Menely, Wadsworth Menely and Norman H. Bryan; president, Clinton H. Menely; secretary and treasurer, Wadsworth Menely.

The mills of the Thatcher Car Wheel Company of Albany, N. Y., are now running on full time and with a large force of employees.

The American Steel Trunk Company, to manufacture steel trunks in Detroit, Mich., with principal office in North Tonawanda, N. Y., have been incorporated with the Secretary of State at Albany, N. Y., with a capital of \$10,000.

The new Steel Dash & Fender Company recently incorporated to do business at Niagara Falls, N. Y., have organized. The capital stock is \$30,000, divided into 600 shares, largely taken by Niagara Falls business men. They have chosen the following officers: President, Charles W. Johnson; vice-president, Jacob A. Schneider; secretary, Walter A. Bennett; treasurer, John C. Schneider; attorney, George W. Knox. A factory for the manufacture of steel dash boards and fenders has been run by Charles W. Johnson, the president of the new concern, in the Carlos Holly Building at Lockport, N. Y. It did a large business and will soon be removed to Niagara Falls. The new company will also do a general manufacturing business.

The United States Headlight Company have filed a certificate of incorporation with the Secretary of State, at Albany, N. Y. It includes the Steam Gauge & Lantern Company of Syracuse, the Williams Headlight Mfg. Company of Utica, and factories in Rochester, N. Y., Dayton, Ohio, Chicago and St. Louis. The capital of the company is \$1,500,000. The principal office of the company is to be located at Utica, N. Y. Their purpose will be to manufacture and sell all locomotive headlights, electric or otherwise, and to sell appurtenances and other small articles. They will have branches in the cities of Rochester, Syracuse, Chicago, Dayton and St. Louis. The directors are: Irving A. Williams, Utica; Pomeroy L. Salmon, Syracuse; Frank L. Upton, Rochester; Ward M. Willets, Chicago; Joel Kirby, Jr., Dayton, and Alexander Handlan, St. Louis. The organization of this company takes in the six largest manufacturers of locomotive and street railroad headlights and appurtenances in the country. For the time being the different companies in this combination will continue to manufacture in their present plants, but it is believed that this plan will not be long in operation. Probably the business of manufacture will in the future be centered in one locality.

The Commercial Wheel Company have been incorporated at Indianapolis, Ind., to handle the output of the wooden wheel makers. The incorporators and directors are David E. Allen of Indianapolis, Oscar B. Bannister of Muncie, Dwight S. Smith and Samuel B. Collins of Jackson, Mich.; Jacob D. Early, E. Miller France, Joshua Jump, Deloss W. Minshall, Demas Deming, Edward P. Fairbanks, Crawford Fairbanks, J. H. Keyes and Charles Minshall of Terre Haute, Theodore N. Johnson of Freeport, Ill.; Seth S. Wheeler of Lima, Ohio, and Edward Flickinger of Galion, Ohio. The capital stock is \$200,000 in \$50 shares.

A. F. Jackson, A. C. Scott, A. F. Ladd, W. H. Clark and C. J. Jones have organized the Jackson Plow Mfg. Company, at Oklahoma City, Oklahoma, with a capital stock of \$20,000.

Among recently organized corporations in Illinois are the following: McCosh Steel Company, Chicago; capital stock, \$250,000; incorporators, Thompson McCosh, John Alex. Cooper, William H. Leech. Consolidated Patent Can Opening Company, Chicago; capital stock, \$1,000,000; incorporators, William Brace, John C. Campbell and John S. Rountree.

The city press of Spokane, Wash., speak with much commendation of the facilities enjoyed by the National Iron Works of that place for manufacturing light and heavy cast iron work and general structural work. The president of the company is J. H. Boyd.

The Illinois Zinc Company of La Salle, Ill., have reduced the wages of their rolling mill employees 10 per cent. and of other labor, clerks, &c., 10 to 15 per cent. It is but a short time since wages at these works were advanced 5 per cent., so that the cut is not a severe one, and yet for several days a strike seemed probable. The zinc furnace workers have been stimulated to greater care by a premium of about 1 cent on each 100 pounds turned out by a furnace, so as to reduce the loss of zinc running into the cinder.

The Berlin Iron Bridge Company of East Berlin, Conn., have received the contract for an iron roof for the boiler and engine room of De Land & Co. at Fairport, N. Y. The roof will be covered with the Berlin Iron Bridge Company's patent anti-condensation corrugated iron.

Among new incorporations in Wisconsin are the following companies: The Charles Abresch Company of Milwaukee, to manufacture vehicles; capital, \$200,000; incorporators, Chas. Abresch, Andrew Hofherr, Louis Schueller, Jr., and H. P. Ellis. The Telegram Cycle Mfg. Company of Milwaukee, capital, \$75,000; incorporators, W. H. Wolf, F. R. Pingree, W. H. Momsen.

The fact has already been noted in these columns that the affairs of the Pittsburgh Brass Company of Pittsburgh, with works in Allegheny, Pa., have been placed in the hands of a receiver. In regard to this action, we are advised that a judgment was entered against the firm because of the uncalled for action of a very small stockholder, who was endeavoring to hamper the management for purely personal motives, and it was feared by the officials of the firm that his action might be misconstrued and lead to action on the part of some creditors, which might jeopardize the interests of others and of the stockholders as a whole, and that under the circumstances the rights of all parties would be best conserved by placing the concern in the hands of a receiver. Application was therefore made, and Jos. McNaugher, vice president of the company, was named by the courts as receiver. The business will be conducted as usual, and it is believed that all claims will be satisfied within a short time. The good assets of the company are stated to be not only considerably in excess of outside liabilities, but of the entire capital stock as well, amounting to \$250,000.

The Walter A. Wood Mowing & Reaping Machine Company of Hoosick Falls, N. Y., have chosen the following trustees: C. E. Dudley Tibbits, Walter F. Warren, N. H. Russell, John W. Griswold, William H. Nichols, J. Russell Parsons, Ralph G. Starks, Henry Burden and Danforth Geer. The company have received and approved of the reports of their officers.

The West Virginia Bridge Company have been organized at Point Pleasant, W. Va., for the purpose of engaging in the manufacture, selling and erecting of wrought and cast iron columns for buildings, bridges, &c.

The Pioneer Thresher Company, successors of the Terman Mfg. Company, at Fairbault, Minn., have made additions and improvements in the plant and are making active preparations to do a large business in the manufacture of the Dorton automatic band cutter and self feeder the coming season. The establishment is under the immediate charge of T. A. Whitworth, secretary, and R. E. Dorton, superintendent of the mechanical department.

The Sheriff has received two attachments against the Newark Brass Company of Newark, N. J., one for \$1047, in favor of Hendricks Brothers, and the other for \$452, in favor of the H. W. Johns Mfg. Com-

pany, both of New York. The Newark Brass Company have been in business since July, 1886, have a capital of \$50,000, and did business in Newark and Jersey City.

The Electric Pipe & Bending Company's works, at Newark, N. J., are to be enlarged by the erection of a building to cost \$25,000.

The J. L. Mott Iron Works, at 133d street, New York, which have been shut down for the past few months, are now reopened and running full time.

A special from Raleigh, N. C., states that a contract has been signed by which the Lobdell Car Wheel Works of Wilmington, Del., will build and operate a large car wheel factory at Raleigh. Reports of such an arrangement have been afloat before.

Trade Publications.

THE BASS CORLISS ENGINES and also boilers and all appliances for complete modern steam plants are illustrated and described in detail in a catalogue by the Bass Foundry & Machine Works of Fort Wayne, Ind. In addition there is given a collection of valuable rules and tables, arranged in convenient form for the purpose of making the volume a handy book of reference for steam users.

The 1894 CATALOGUE OF JENKINS BROS. of 71 John street, New York, has been received. It is stated in the introduction that valves made by them contain valuable improvements and are made of the best steam metal. The iron body valves have been improved by increasing the thickness of the flanges and adding more bolts—making them suitable for either high or low steam pressure. The Jenkins disks have also been improved and they will stand high steam pressure. The catalogue describes very fully the many sizes and types of valves and fittings made by this company.

SHAFTING, PULLEYS, HANGERS, &c., are described in full in a catalogue issued by A. & F. Brown of 17 Dey street, New York. All shafts made by this firm are of carefully selected steel, finished to gauge and highly polished. The pulleys are made of a special mixture of iron of unusual toughness, by means of which all superfluous metal is avoided. The regular hangers are all made double braced and designed to obtain the greatest strength without loading the building with a superfluous weight of iron. The frames are made with movable yokes so that the shaft with pulleys on can be lifted into place or taken out without taking down the hanger frame. The bearings or boxes are very long, lined with good Babbitt metal, which is hammered in and then bored out to fit the shaft. The ends of the boxes are faced off, presenting a smooth surface for the shaft collar to run against. The boxes are self adjusting in the frame, so that the shaft will always bear equally on the entire length of the bearing and so avoid undue friction.

Royalties are being reduced on Lake Superior ore. The Chapin Mine royalty is now but 15 cents against the old rate of 40 cents. Rail freights from the mine to the shipping port have also been cut from 65 to 52 cents. The days of rich returns to everybody connected with Lake Superior iron ore mining are evidently over.

The Benedict & Burnham Mfg. Company of Waterbury, Conn., are building a mill for rolling seamless brass and copper tubing by the Mannesmann rolling method. It is probable that the mill will be ready for operation in about two months.

The Commissioner of Public Works, Chicago, opened bids on the 26th ult. for the superstructure of the new Van Buren street swing bridge. There were 12 bidders, whose figures ranged from \$85,000 to \$59,700. The lowest bidder was A. Gottlieb of Chicago.

The Iron and Metal Trades.

During the past week the improvement in certain branches of the Iron trade has gained further headway and a far more cheerful tone prevails. Buyers have taken hold, and it looks as though some of them have already missed their best opportunity.

The past week has been very active in Western Steel markets. The low prices made on Steel Billets—\$15, Pittsburgh, having been undoubtedly done in a few cases—and the heavy demand in the Wire trade have led to heavy purchases of Billets and a large volume of inquiries. Our Chicago correspondent reports sales of 40,000 to 45,000 tons of Billets and Wire Rods in that market, and it is known that Pittsburgh has taken large orders and that inquiries for about 30,000 tons are in the market. The lowest prices have been withdrawn and makers are now asking more money both for Billets and for Wire Rods. Developments this week will teach whether this advance, as yet nominal, will cause buyers to withdraw.

The Rod mills, although the largest, have certainly not been the only purchasers. Street Rail mills, Skelp mills and Bar mills have also been buyers. Still all the interests last referred to have not had the heavy orders which would force covering, and they may not see fit to buy until their own sales have become larger.

The Bessemer Pig situation is as yet unchanged. Lower prices have been made at Pittsburgh, where \$10.50 has been cut. Under exceptional circumstances a transaction of some magnitude has taken place at Cleveland at \$10, delivered, which is the lowest on record considering the delivery.

In Foundry and Forge Irons there is a better feeling so far of volume of business is concerned, but prices are still very weak and it will take quite large sales before an improvement sets in.

In the Wire trade a stiffening in prices has taken place, as the result of large orders, induced obviously by the very low prices. Wire Nails have sold at Western factories, in large blocks, at the extraordinary price of 90¢ a keg. Now \$1.05 is being asked by some makers. It is stated that two mills alone have orders for close on to 500,000 kegs on their books. Greater activity is also spreading in the Barb Wire trade.

An interesting item is the capture by the American Tube & Iron Company of an order for 60 miles of Wrought Iron Line Pipe for the Ontario Natural Gas Company. It may be remarked in this connection that the Canadian Iron markets are worthy of close study by our mills. The Dominion trade generally stocks up in the fall until the next spring, so that little could be done until now. But the time is now approaching when a vigorous campaign in Canada might lead to some good contracts.

Outside of an order involving about 600 tons, there is little Bridge work on the market, but a good deal of Structural work is coming up.

The Cleveland Ore situation is still featureless. The furnaces are carrying a good deal of Ore. Thus one large producer in the Pittsburgh district claims to have a stock of 500,000 tons on hand.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, }
CHICAGO, January 31, 1894. }

A notable change has occurred the past week in the tone of this market, caused by the large transactions in several lines of trade. One railroad company is known to have placad orders divided between Chicago and St. Louis for not less than 25,000 tons of track material, exclusive of Steel Rails. A sale is also reported of about 6000 tons of Steel Skelp for a Pipe works. Large transactions are noted in Steel Billets and Wire Rods. The Wire Nail trade is extremely active at advancing prices and buyers are hurrying to place their orders in anticipation of higher rates. Barb Wire is feeling the impu'se toward higher values and is also becoming active. A noteworthy feature is the attempt of some large buyers to place orders without success at rates prevailing two or three weeks ago, which they at that time refused to believe were bottom. The only discordant note at present is the continued low price of Pig Iron.

Pig Iron.—Business in local Coke has been a little better. More orders were taken than during the previous week, and inquiries continue to come in from new directions. Consumers, however, are not at present inclined to anticipate their requirements more than for a month ahead, so that orders are largely for immediate shipment. Prices have been slightly reduced, as will be seen by the quotations below. Southern Coke Iron is also moving in small lots only and prices are a little weaker, also leading to revised quotations. Ohio Softeners are in quite good demand in small lots for quick delivery. Lake Superior Charcoal Iron is quiet. Quotations are now as follows for cash:

Lake Superior Charcoal.....	\$15.30 @	\$15.50
Local Coke Foundry, No. 1....	12.50 @	13.00
Local Coke Foundry, No. 2....	12.00 @	12.50
Local Coke Foundry, No. 3....	11.75 @	12.00
Local Scotch.....	13.00 @	13.50
Ohio Strong Softeners No. 1....	15.00 @	15.50
Southern Silvery, No. 1.....	..... @	13.75
Southern Silvery, No. 2.....	..... @	13.25
Southern Coke, No. 2.....	11.50 @	11.65
Southern Coke, No. 3.....	11.00 @	11.50
Southern, No. 1, Soft.....	11.50 @	11.65
Southern, No. 2, Soft.....	11.00 @	11.50
Tennessee Charcoal, No. 1....	16.00 @	16.50
Tennessee Charcoal, No. 2....	..... @	15.00
Southern Gray Forge.....	10.60 @	10.85
Alabama Car Wheel.....	18.00 @	18.50
Jackson County Silvery.....	16.00 @	16.50
Other Ohio Silvery.....	15.00 @	15.50

Bars.—The inquiry has increased, but it is mainly for small lots to cover immediate wants. The largest sale that has transpired was one of 300 tons. A few inquiries have been received from large consumers who wish to contract at present prices for the whole of 1894, but manufacturers are not willing to name a rate for such a long time ahead. Even on shorter deliveries of large lots they are disposed to ask higher prices than for small lots for immediate shipment. A distinction is being made in the quality of Steel Bars now selling, and the best known makes are quoted at 1.35¢ @ 1.40¢, half extras, Chicago delivery, which is somewhat higher than the market rate on inferior grades. Bar Iron is selling at 1.25¢ @ 1.35¢, Chicago, and it would require a good specification to shade the inside figures. Competition among jobbers is somewhat sharper than it has been, and while prices from stock are quoted at 1.50¢ @ 1.60¢ according to quantity and quality, sales are made at cut rates.

Structural Material.—A large office building which has been hanging fire for a year is now being financed and it

is expected to be shortly in the market for Beams and Columns. Elevated road work is also becoming more definite, and good contracts will be open for bids at an early day. The chances are that some of these may call for Iron instead of Steel. Small orders for Beams have been fairly numerous during the past week, but prices have not improved. Quotations are as follows, Chicago delivery: Beams, 1.55¢ @ 1.60¢; Tees, 1.85¢ @ 2¢; Angles and Universal Plates, 1.50¢ @ 1.60¢. Small lots are sold from stock at an advance of about 15¢ @ 100 above these prices.

Plates.—The steady increase in business reported for the last couple of months continues. More of the trade than usual is now taken direct by mills, owing to their ability to make very prompt shipments, which causes them to cater to the small trade, which in times of activity is handed over to the stores. Mill shipments, Chicago delivery, are quoted as follows: Tank Steel, 1.50¢ @ 1.60¢; Flange Steel, 1.90¢ @ 2¢; Fire Box, 2.75¢ @ 5¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 2¢ @ 2.10¢; Tank Steel, 1.90¢ @ 2¢; Flange Steel, 2.40¢ @ 2.65¢; Boiler Tubes, 70 and 5¢ off.

Sheets.—The market is steadily becoming more active in Black Sheets. Inquiries are being received from merchants and large consumers. The dissolution of the trunk makers' combination has ended the concentration of buying for that trade, and scattering orders are now coming forward from individual concerns for the light gauges used for trunks. Quotations on mill shipments of No. 27 Common are still 2.60¢ @ 2.65¢, Chicago, with small lots from stock selling at 2.80¢ @ 2.90¢. Galvanized Iron is moving about the same as before, the manufacturers' agents reporting good sales at unchanged prices—namely, 75 and 10% for mill shipments of Juniata Galvanized, with small lots from stock quoted at 70% to 70 and 10%. Sheet Copper is quoted at 30% @ 35% off, according to quantity.

Merchant Steel.—Specifications are coming in quite freely from Agricultural manufacturers, but new business is not very heavy at present. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery, Tire and Open Hearth Spring Steel, 1.85¢ @ 1.95¢; Ordinary Bessemer Machinery, 1.55¢ @ 1.65¢; Bessemer Tire, 1.50¢ @ 1.60¢; Ordinary Tool Steel, 6¢ @ 7¢; Specials, 12¢ and upward.

Billets and Rods.—A very great improvement has taken place in these lines. Sales the past week have aggregated 30,000 tons of Billets and 20,000 to 25,000 tons of Rods. The Joliet Rod Mill started up on Monday after an idleness of over a year. Prices are continued at \$18 @ \$18.25 for Billets at Joliet and Wire Rods are quoted at \$25.

Rails and Track Supplies.—Business is looking somewhat better in the Steel Rail trade, but orders are still coming in very slowly. Railroad managers seem disposed to move conservatively in this matter until they can form some impression of the probable course of traffic this year. Prices are unchanged at \$25 @ \$27, according to quantity. Track Supplies are quoted at 1 40¢ for Splice Bars; 2.50¢ @ 2.55¢ for Track Bolts with Hexagon Nuts, and 1.90¢ @ 1.95¢ for Spikes.

Old Rails and Car Wheels.—While \$12 @ \$12.50 would appear to be the

price for Old Iron Rails from the standpoint of railroad managers, consumers believe that \$11 is about the best price they could pay under existing conditions. Negotiations are understood to be pending which may establish a rate for this material. Old Steel Rails are quoted by dealers at \$10 for long lengths, but short pieces are practically unsalable. Old Car Wheels are quoted at \$10.50 @ \$11, according to quantity, with a sale of 1000 tons reported.

Scrap.—The demand for Wrought is very limited from consumers. Only one sale is known to have been made during the week and that was for but 200 tons. Cast Scrap is in much better demand. The market price of No. 1 Forge per net ton may now be quoted at \$8.50 @ \$9; Pipes and Flues, \$6; Cast Borings, \$4; Wrought Turnings, \$5.25; Heavy Cast, \$8.75; Stove Plate, \$7. There is no market for Mixed Steel.

Metals.—Carload lots of Lake Copper are unchanged at 10 $\frac{1}{2}$ ¢. Casting Copper is in light demand and quoted at 9 $\frac{1}{2}$ ¢. Spelter is a little stronger and is quoted at 3.40¢. Pig Lead is also firmer, but quotations have not been advanced above 3.10¢.

Backman, Forsyth & Co. is the style of a new Pig Iron firm in Chicago, whose office is located in room 521 The Rookery. W. W. Backman, the senior member of the firm, is a veteran in the Chicago Pig Iron trade. The junior member is H. A. Forsyth, formerly with the Chicago Furnace Company and Forster, Hawes & Co. and of long experience in the Pig Iron business. The new firm will transact a commission business in Pig Iron and Coke, handling Lake Superior Charcoal and Coke Iron, Ohio Scotch and Silveries, Southern Coke and Car Wheel Iron, Connellsville Coke and Old Car Wheels. They are arranging for several exclusive agencies.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., January 30, 1894.

The situation is not materially different to what it was a week ago, but the general impression is that there is a slight turn for the better. There is more business, and in many cases there is a disposition to resist anything that would involve further shading in prices, so that the market begins to look as though it had at last touched bottom. Billets have been sold at lower figures than ever before, and Pig Iron is also at the lowest ever recorded, but unless all signs fail, a reaction is not far distant. There is nothing specially bright in the immediate outlook, but the fact that the demand is broadening and that prices are either down to actual cost or below that point is having its effect, and will doubtless result in a gradual return to normal conditions. This brief statement is believed to define the situation as favorably as the prevailing conditions warrant, although there is reason to hope that within the next two or three weeks it may be possible to take stronger ground than we feel at liberty in taking under present circumstances.

Pig Iron—A fairly active demand may be reported, and in some cases lots of considerable size have been taken, but on the average it has probably been at some slight sacrifice in prices. There is a conviction, however, that low prices have come to stay, so that when a desirable order is on the

market there is a disposition to take it without regard to a few cents per ton from ruling quotations. It is very difficult to give exact prices without detailing the entire transaction, which is manifestly impossible. General quotations, however, are about as given herewith; but it would be a little misleading to suppose that any large amount of business is done at the outside figure. As a matter of fact, the heaviest end of the business is at the inside figure, or very close to it, and in special cases even the inside figure can be shaded a few cents per ton. All depends on what a buyer may need, and if one can take 500 or 1000 tons, it is not to be expected that a 50 or a 100 ton lot can be had on equally good terms—and, moreover, the large consumer is not likely to be wedded to any particular brand, so that he can average his requirements at lower figures than by insisting on some special Iron. The events of the past six or eight months have compelled the strictest economies everywhere, and as makers have doubtless surprised themselves at the low cost compared with former years, consumers are also just as watchful, and if one Iron seems to be a little cheaper than another it does not require much effort to get it introduced. Nevertheless, for some purposes a matter of a dollar a ton is no particular object; high grade Irons have their place, and they will always command a price relatively higher than those of average quality, which serve their purpose well enough in a mixture, but are unsuitable for special purposes. With these general remarks, it may be added that while the demand appears to be broadening, the supply is equal to all requirements; hence prices are unchanged, and from present appearances are likely to remain so indefinitely. For Philadelphia and equivalent deliveries quotations range about as follows:

No. 1 Foundry	\$13.00 @	\$14.00
No. 2 Foundry	12.50 @	13.25
Standard Gray Forge	11.25 @	11.75
Ordinary Gray Forge	10.75 @	11.00

Steel Billets.—Prices seem to have reached rock bottom, and while it would be difficult to state with absolute certainty that \$17 has been reached for Eastern delivery, it is pretty safe to say that less than \$17.50 has been done. Asking prices to-day are \$17.75, and makers claim to be utterly indifferent about doing business at less, but as they have said the same thing all the way down from \$22.50, buyers are inclined to smile at any statement of that kind. Nevertheless, there must be a turning point somewhere, and when everybody knows that the inside figure must be cost or less than cost, it is about time to look for a reaction. Buyers are very skeptical, however, and unless they need material somewhat urgently (which they do not) it is difficult to get a bid of over \$17 @ \$17.25. A few days or hours may change the situation, but meanwhile no first-class buyer would care to bid much over \$17 @ \$17.25, which is about 50¢ less than makers are willing to name as an open quotation. There is a strong suspicion that some of the larger concerns are getting special rates of freight. Their sales are chiefly at a delivered price, and as that is so much lower than those who pay tariff rates can afford, the feeling is pretty strong that the railways are giving rebates to these parties.

Finished Material.—There is a gradual increase in the volume of business, and, as something unusual, it may be said that prices are no lower

than they were a week ago. For months past there has hardly been a sale which was not at a lower price than the one preceding, but at last it begins to look as though bottom had been reached. There is no improvement, however, and nothing to indicate that there will be in the near future, but at 1.25¢ @ 1.30¢ for Bars and Plates, it is surely about time that a halt was called. These figures have been reached on competitive orders, but ordinarily 10¢ @ 15¢ more is quoted, and for small lots in which quality is an essential consideration still better prices are realized. There are no specially large orders on the market, but daily requirements appear to be large enough to keep the mills moving, and in some cases more actively than for a long time past. There is a good deal of work "hung up," which it is hoped will soon become active, in which case the volume of business would come pretty near to ordinary times. Inquiries are also more numerous, so that the feeling is hopeful, although it is felt that the chance for materially better prices is rather remote. Ordinarily small lots are quoted about as follows, delivered:

Grooved Skelp, delivered.....	1.37 $\frac{1}{2}$ ¢ @	1.42 $\frac{1}{2}$ ¢
Best Refined Bars.....	1.40¢ @	1.45¢
At interior points.....	1.25¢ @	1.30¢
Tank Steel.....	1.40¢ @	1.50¢
Heavy Plates.....	1.45¢ @	1.50¢
Shell.....	1.60¢ @	1.75¢
Flange.....	1.90¢ @	2.00¢
Angles.....	1.60¢ @	1.70¢
Beams and Channels.....	1.65¢ @	1.80¢

Old Material.—Supplies are very much in excess of the demand, so that it is useless to ask better prices. On the other hand, there is no possible margin for reductions, consequently dealers are doing very little, and are not trying to do anything under present conditions. Nominal quotations are about as follows, delivered:

Heavy Melting Steel.....	\$10.50 @	\$11.50
Light Melting Steel.....	8.00 @	9.00
No. 1 Wrought Scrap.....	11.00 @	12.00
Machinery Cast.....	9.50 @	10.50
Wrought Turnings.....	9.00 @	10.00
Cast Borings.....	6.00 @	7.00
Old Iron Rails.....	13.00 @	13.50

C. R. Baird & Co. have opened an office for the sale of all kinds of Pig Iron at 46 Bullitt Building. C. R. Baird was with the late firm of Chamberlain, Turney & Baird.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts., CINCINNATI, January 31, 1894.

There has been no increase in the volume of business in Pig Iron during the week, and no improvement in prices. The transactions have been of a retail character and in the aggregate foot up less than 5000 tons. There is, however, more urgency to sell Foundry grades and buyers could obtain concessions of at least 25¢ per ton for both spot and forward delivery, if they would make the bids. Gray Forge is not so pressingly offered as Foundry grades, but might be bought at a corresponding reduction. No. 2 Foundry is offered at \$7.55, and No. 3 Foundry \$7.25, f.o.b. Birmingham, deliveries to begin now and to continue during the next eight months, or the delivery would be made to meet the convenience of the buyer within that time. The fact is the market is in such a demoralized condition that in the absence of buyers it is difficult to say how low they might secure Iron. There is no demand for any considerable lots of Char-

coal Iron, but there are small sales at previous prices. Quotations are merely nominal, as follows:

Foundry.

Southern Coke, No. 1.....	\$11.75 @ \$12.00
Southern Coke, No. 2.....	10.50 @ 10.75
Southern Coke, No. 3.....	10.00 @ 10.25
Ohio Soft Stone Coal, No. 1....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2....	14.50 @ 14.75
Lake Superior Coke, No. 1.....	15.00 @ 15.25
Lake Superior Coke, No. 2.....	14.00 @ 14.25
Hanging Rock Charcoal, No. 1..	18.50 @ 19.00
Hanging Rock Charcoal, No. 2..	17.50 @ 18.00
Tennessee Charcoal, No. 1.....	14.00 @ 14.25
Tennessee Charcoal, No. 2.....	13.00 @ 13.25

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable.....	17.00 @ 17.25

Forge.

Gray Forge.....	9.75 @ 10.00
Mottled Coke.....	9.50 @ 9.75

St. Louis.

(By Telegraph.)

Office of The Iron Age,
Bank of Commerce Building,
St. Louis, January 31, 1894.

Pig Iron.—The only feature in this department is the sale of 2200 tons No. 2 Foundry Iron to a local stove works. Outside of this sale the market is dull and uninteresting. Extreme low prices prevail, and at the moment there is nothing in the situation to warrant any hope of improvement. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry.....	\$12.00 @ \$12.25
Southern Coke, No. 2 Foundry.....	11.00 @ 11.25
Southern Coke, No. 3 Foundry.....	10.50 @ 10.75
Southern Gray Forge.....	10.00 @ 11.25
Southern Car Wheel.....	17.00 @ 18.00
Lake Superior Car Wheel..	16.50 @ 17.00
Ohio Softeners.....	1.75 @ 16.25

Bar Iron.—There is practically no change to report. Orders are limited and prices are weak and inclined to go lower. Car manufacturers are either not running at all or else only working half time, while the railroads are buying only as they absolutely need. We quote 1.25¢ from mill, which price is difficult to shade. Jobbers ask 1.55¢ @ 1.65¢, according to quantity.

Barb Wire.—The proposed combination among the Barb Wire mills has not as yet taken definite shape, although it looks more favorable now than when our last report was written. The scarcity of Wire Rods has caused a general stiffening in prices, which is augmented by the fact that mills are crowded with orders and have trouble making prompt shipments. Prices are unchanged, as follows: Painted, \$1.90 @ \$1.95, with 40¢ per hundred weight additional for Galvanized.

Wire Nails.—The demand for Wire Nails is on the increase, but prices are more or less affected by the action of a leading hardware jobbing house who are quoting \$1.10 but who refuse to sell more than 25 kegs at this price. At this price there is no profit in them, but as they are only used as a leader to sell hardware there will probably be no loss. The legitimate market is \$1.20 @ \$1.25 from mill.

Rails and Track Supplies.—There is no improvement to note. Railroads are allowing their equipment to stand unrepaired rather than purchase at this time. We quote Splice Bars, 1.45¢ @ 1.50¢; Spikes, 1.80¢ @ 1.85¢; Bolts, Square Nuts, 2.25¢; with Hexagon Nuts, 2.35¢; Links and Pins, 1.80¢ @ 1.85¢. Old Iron Rails nominally \$13. Steel Rails, \$26 @ \$27, according to quantity.

Pig Lead.—The market is a trifle firmer, and several carload orders are reported at 3.05¢. There is no snap to the market, and any rapid improvement seems out of the question.

Spelter.—The market is feverish and prices are hard to gauge. A sale of between 400 and 500 tons is reported at 3.25¢ at the close to-day; 3.30¢ is the asking price, but consumers do not take hold at this figure.

The Ewald Iron Company, St. Louis, Mo., are sending out to their friends in the trade a very handsome vest pocket memorandum book. The book is bound in leather, and carries on the front outside cover a view of their exhibit which attracted so much attention in the St. Louis Exposition, and which exhibit was originally intended for the World's Columbian Exposition, but was not placed there on account of the small space assigned them. The back cover carries a view of the Tennessee Rolling Mills, at Louisville, Ky., which are owned and operated by this company. The fly leaves of the book contain useful tables, giving the estimated weight table of round and square Iron in pounds per foot, weight of Boiler Heads, weights per foot of Angle Irons and weight of Flat Iron. A calendar is also inclosed in the book. The pages are perforated so that they may be torn out and used, and additional pads will be furnished by the company on application.

Pittsburgh.

(By Mail.)

Office of The Iron Age, Hamilton Building,
Pittsburgh, January 30, 1894.

The signs of improvement in the Iron and Steel trades are becoming more distinct, and the belief is becoming general that the worse of the long depression is over. By this we do not mean that prices are any better, but we do mean that more inquiries are in the market, and buyers at last seem to have come to the conclusion that it is time to look into the market with a view of replenishing depleted stocks. Pig Iron alone seems to be the only product that is not feeling the benefit of these increased inquiries. However, if one half of the deals for Steel that are now under way go through it cannot help but improve the demand for metal. In Structural Material and Plates the outlook for heavier business is considerably improved. Bars are also looking up a little, while the same is true of the larger sizes of Pipe. Wire Rods for prompt delivery are scarce, while Wire and Wire Nails are in heavy demand and are showing a decidedly firmer tendency in prices. Coke is dull and neglected and has sold down to 90 cents, or less, at oven. Take as a whole the situation is improved, and with a material increase in volume of business we can commence to think about a recovery in prices, which is bound to come just as soon as the mills get their order books in fairly good condition. In this connection it is pertinent to state that reports that Pittsburgh is unloading Steel in Eastern markets at prices equal to \$15, Pittsburgh, and less, are untrue to considerable extent. While Pittsburgh has sold Steel at prices uncomfortably close to \$15, it is also true that offers based on less—\$17, delivered, or \$14.70 Pittsburgh—have been turned down.

Pig Iron.—The week under review showed no improvement in the Pig Iron

trade, with the exception that inquiries for Gray Forge and Foundry were perhaps a little more plentiful. Bessemer is freely offered at \$10.50, Pittsburgh, with very little changing hands. As near as can be learned this price has not been shaded. During the week Gray Forge has sold down to \$9.50, delivered at buyer's mill, while city furnaces are refusing to shade \$9.75, and some are holding out for \$10, delivered. No. 2 Foundry Iron is looking up a little in demand, very little No. 1 being sold in this market. The list of active furnaces has been increased during the week by the blowing in of Tod of the Youngstown Steel Company, at Youngstown, Ohio, and Sharon of Hall & Co., at Sharon. We quote as follows:

Neutral Gray Forge.....	\$9.50 @ \$9.75 cash.
All-Ore Mill.....	9.75 @ 10.00
No. 1 Foundry.....	11.75 @ 12.00
No. 2 Foundry.....	10.75 @ 11.00
Bessemer.....	10.50 @ 10.60

We note a sale of 500 tons of Bessemer at \$10.50, Pittsburgh; 2000 tons of Gray Forge at \$9.60, Pittsburgh, and 1000 tons of Gray Forge at \$9.50, Pittsburgh.

Billets.—The extraordinarily low prices ruling for Soft Steel Billets have at last stirred up the buyers, and as a result the market is full of inquiries. However, buyers and sellers are somewhat apart in their views, and as a result very few deals have yet been closed. From the Eastern market a good many inquiries have been received, but as many of these are based on \$15 and less for Steel they have been turned down. Cleveland buyers are also sounding the market, and we have personal knowledge of inquiries aggregating some 30,000 tons. Of the five concerns in the Pittsburgh district, three have positively refused to meet the market and are holding off for \$16 at mill. The same is true of the Wheeling district, the makers there refusing to take orders at less than \$16 @ \$16.50. From this it will be seen that the bottom has about been touched, and it is doubtful if \$15.50, Pittsburgh, would be shaded. An upward turn in the price of Steel in the next week or two would not be a surprise. No concern in the country can make Steel and sell it at \$15 and make a profit, and makers have finally decided to retire from the market in preference to selling material at a direct loss.

Ferromanganese.—Demand continues very light and we continue to quote at \$52, delivered at buyer's mill, for 80 % domestic. It is probable that a fair sized order placed at this time would shade this price.

Structural Material.—A leading maker advises us that a material increase in inquiries has been noticeable in the last week or two, and while the amount of actual business being placed continues limited, the outlook for early improvement is very encouraging. In almost every large city in the country one or more buildings are under negotiation, and if one-half of them are put through the demand for Structural Material this year will be far in excess of previous years. A good deal of bridge work will also be done and on the whole the outlook, as far as volume of business is concerned, could hardly be better. The contract for Youngstown delivery, referred to last week was secured by Pittsburgh, the Youngstown Bridge Company being awarded the contract for the buildings. Prices on Shapes of all kinds continue very low, but with a heavy demand it is believed that bottom has about been reached. We quote as follows: Beams and Chan-

nels up to 15 inches, 1.25¢ @ 1.30¢, according to order. Angles and Universal Plates, 1.25¢ @ 1.30¢; Tees, 1.50¢ @ 1.60¢.

Plates.—There is nothing of special interest to report this week. Prices made by Pittsburgh makers continue to capture business in every territory, and last week quite a large order for Chicago delivery was taken, but at extremely low prices. A slight increase in inquiries in the market is noticeable, and it is believed that the volume of business will soon show improvement. We quote as follows: Tank Steel, 1.25¢ @ 1.30¢; Shell, 1.40¢ @ 1.50¢; Flange, 1.50¢ @ 1.60¢; Ordinary Fire Box, 1.75¢; Railroad Fire Box, 2¢.

Bar Iron.—Compared with the same period of last month there is a slight increase in volume of business, while inquiries are decidedly better. Now that the season for spring trade to open is upon us makers believe that they will soon be favored with a material increase in demand. In the Valley district the mills are making a little better time, and the same is also true of the Pittsburgh district. It is hardly necessary to state that prices are no better, nor, on the contrary, can they be said to be very much worse, although the size of the order and the conditions surrounding it still have a great deal to do with the price. For ordinary lots we quote Steel Bars at 1.20¢ @ 1.25¢, with Bar Iron extras, and our lower quotation continues to be shaded for desirable specifications. In the Valley Iron Bars are held at 1.15¢ at mill, half extras, but this price is also shaded for desirable business.

Muck Bars.—Little or nothing is doing, and we make nominal quotations of \$20 @ \$20.25, delivered at buyer's mill, for best grades.

Merchant Steel.—Within the last week or two specifications have come forward more freely, and the outlook is a little better. The friends in the trade of the Linden Steel Company will be pleased to learn that the first payment of the indebtedness of that concern, which comes due in August next, will be paid at an early date, as the firm have the money on hand and desire to get it into the hands of their creditors as soon as possible. There will also be a material saving effected in interest charges. Prices are without material change, and we continue to quote as follows: Bessemer Machinery, 1.45¢ @ 1.50¢; Open Hearth Machinery, 1.70¢ @ 1.75¢; Machine Straightened Tire, 1.60¢; Sleigh Shoe, 1.75¢ @ 1.85¢; Toe Calk, 1.90¢ @ 2¢; Open Hearth Spring, 1.85¢ @ 1.90¢; Tool Steel, 5½¢ and upward.

Skelp Iron and Steel.—The slight improvement noted in the Pipe and Tube trade will doubtless soon be felt in the Skelp market, and it is understood that one or two large inquiries are already in the market. The low prices ruling for Soft Steel Billets continue to have a sympathetic effect upon the price of Steel Skelp, which we quote as follows: Grooved Steel Skelp, 1¢ @ 1.10¢; Sheared, 1.10¢ @ 1.20¢; Grooved Iron Skelp, 1. 7½¢ @ 1.20¢; Sheared, 1.27½¢ @ 1.35¢.

Pipes and Tubes.—There is no improvement to note in the demand for Merchant Pipe, but for the larger sizes of Line Pipe there are more inquiries in the market, and it is expected that within a short time some contracts for Western gas fields will be placed. Already it is stated that one contract in-

volving some 50 or 60 miles has been closed. Prices are without material change, depending altogether upon the nature of the business.

Wire Rods.—There is a decided scarcity of Wire Rods for early shipment, and prices are firm, with an upward tendency. In this district no Rods are obtainable for early delivery, and the same is largely true of mills in other sections. We continue to quote at \$23.50 at makers' mill, and it is possible this price would not be made on Rods for prompt shipment.

Wire Nails.—As noted last week, the demand for Wire Nails is very active, and mills, as a rule, are pushed to their utmost in order to get out product as fast as wanted. Prices are stiffening up to some extent, and Wire Nails are being held firmly on the basis of \$1.05 in large lots and \$1.10 in carload lots at mill. A leading maker of Wire Nails in this district is said to have orders for 240,000 kegs on his books. A slightly better movement in Cut Nails is reported, and the outlook for still further improvement in this respect is promising. We continue to quote Cut Nails at 95¢ at mill for the usual averages, but for desirable orders this price is occasionally slightly shaded.

Barb Wire.—There is a heavy demand for Barb Wire, and already some concerns report having their product sold up for the next three or four months. Mills are holding their product on the basis of 2.10¢ in carload lots for Four-Point Galvanized Wire, and 2.15¢ @ 2.20¢ in less quantities. Painted Wire is being held at 1.70¢ in carload lots, and 1.75¢ in less quantities.

Connellsville Coke.—There is little or no demand for Furnace Coke and prices continue very low, offers to sell having been made on the basis of 85¢ per ton at oven in Connellsville region. Foundry Coke is in fairly good demand and prices are being maintained on the basis of \$1 to dealers and \$1.15 to consumers. Large buyers of Foundry Coke are able to shade these prices slightly, but as a rule they are being firmly adhered to. Crushed Coke, all sizes, is held at \$1.40 to consumers. For the week ending Saturday, January 20, there were 8410 ovens in the Connellsville region in blast and 9106 idle, an increase in active ovens of 266. The tonnage for the week referred to above is estimated at 67,340 tons.

Metal Market.

Pig Tin.—Although a revision of the rules went into effect at the opening of the year under which contract deliveries on the Metal Exchange were made to involve as small lots as 5 tons, thereby offering more inducement for consumers to purchase economically for future delivery, as well as offering greater inducement for outside speculation, the market remains in a flat condition. During the past week there has been more or less fluctuation in prices, with 20¢ the highest and 19.85¢ the lowest point. The highest price named is below the cost of importation of Tin, duty paid, but neither that nor the fact that ordinary trade requirements have made more of less impression upon spot stocks has stimulated business in the slightest degree. Consumers and dealers have purchased only as imperative wants dictated, while prices have averaged somewhat lower for prompt

and near future deliveries. Spot and February delivery has been openly offered at 19.90¢ during the past few days, and *sub rosa* at a shade less, net cash terms. March delivery was publicly offered at 19.85¢. Subsequently 5 tons were sold at 19.75¢. Smaller quantities than 5 tons were relatively quite as low, and, upon the whole, the market has shown rather poor form. Since the McKinley duty went into effect about 1376 tons have been landed here, the greater portion of which remains in bond. There are now afloat for this country 935 tons, including 100 tons Australian, November shipment; 250 tons Straits, December shipment, and 585 tons forwarded from London. Shipments from the Straits during January aggregated 3925 tons, against 4000 tons during the corresponding month last year. In the former is included 2675 tons to Great Britain and America and 1250 tons to Continental Europe.

Copper.—No improvement is noticeable in purchases of Lake Superior Ingot, and the demand, to all accounts, is still on a very moderate scale. Leading producers do not appear as urgent sellers, but offerings of moderate quantities from one source and another have had sufficient weight to keep prices rather weak. At the present time 10¢ is doubtless an extreme high rate. In fact, moderate quantities of the metal are available at a shade less, ordinary terms of sale, while speculators offer at as low as 9½¢ for March and later deliveries. Electrolytic is also rather unsettled, with 9½¢ a common selling price for ordinary brands and 9¾¢ the highest rate for the best, while the demand has improved very little, if at all. Casting stock has been in somewhat better demand at 9½¢ for both export and home trade account, but sellers at less than 9.35¢ are now very few, and 9.40¢ @ 9.50¢ is generally asked for best brands. In circular of January 16 James Lewis & Sons, Liverpool, say: "The market for Copper has been adversely influenced by the continued large arrivals from the United States, which are now almost exclusively in the form of Pig and Refined Copper in different forms. It is stated that very little Matte will in future be shipped, as most of it is being converted into Pig Copper, in order to save carriage, or desilverized before shipment."

Pig Lead.—There has been an advance of about 0.7½¢ on actual sales, 3.25¢ having been paid for carload and larger lots. That price was subsequently bid for additional parcels and refused. Holders are now generally asking 3.30¢ for prompt and forward shipments. The stronger tone is due chiefly to livelier business at Western points, including 25 carloads or more very recently at about 3.05¢ in East St. Louis. Eastern consumers are still very cautious buyers and neither jobbers nor speculators have manifested active interest in forward deliveries despite the movement in the Western market.

Spelter.—Prices have turned somewhat for the better and 3.60¢ @ 3.65¢ seem now to be inside rates for ordinary Western brands, as against fairly free offering at 3.50¢ @ 3.55¢ a week ago. Sales here have been moderate and the demand has shown little, if any, improvement, but business at primary points is reported as being livelier, which, together with some reduction in output latterly, seems to be chiefly accountable for the advance.

Antimony.—Jobbing trade has been of fair volume and sufficient to keep the

market steady at 9½¢ @ 9¼¢ for Hallett's, 10½¢ @ 10¼¢ for Cookson's and corresponding prices for other brands.

Tin Plate.—A somewhat better business has been done in both spot goods and forward shipments, but low prices have ruled in nearly all instances where round lots were involved, and there is no appearance of decided improvement in the tone of the market. For spot goods the following prices are quoted: Coke Tins—Penlan grade, IC, 14 x 20, scarce; J. B. grade, do., \$5.35; Bessemer full weight, \$5.25; light weights, \$4.82½ @ \$4.85 for 100 lb, \$4.77½ @ \$4.80 for 95 lb, \$4.60 for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.45; Siemens Steel, IC basis, \$5.55 @ \$5.60; IX basis, \$6.60. Charcoals—Melyn grade, IC, \$6.35; Crosses, \$7.87½; Allaway grade, IC, \$5.50; Crosses, \$6.65; Grange grade, IC, \$5.60; Crosses, \$6.75. Charcoal Ternes—Worcester, 14 x 20, scarce; do., 20 x 28, \$11.35; M. F., 14 x 20, \$7.25; do., 20 x 28, \$14.50; Dean grade, 14 x 20, \$5.35; do., 20 x 28, \$10.50 @ \$10.60; D. R. D. grade, 14 x 20, \$5.15; do., 20 x 28, \$9.90 @ \$10; Alyn, 14 x 20, \$5.35; do., 20 x 28, \$10.50; Wasters—S. T. P. grade, 14 x 20, \$4.75; do., 20 x 28, \$9; Abercarne grade, 14 x 20, \$4.60; do., 20 x 28, scarce.

The Pittsburgh Reduction Company have issued the following lists on Plate, Sheet and Wire Aluminum:

Aluminum Plate and Sheet, B. & S. Gauge.

	3 in.	12 in.	14 in.	16 in.	18 in.	20 in.	22 in.	24 in.	26 in.	Price per pound for polishing one side
Wider than	3 in.	12 in.	14 in.	16 in.	18 in.	20 in.	22 in.	24 in.	26 in.	
And including	12 in.	14 in.	16 in.	18 in.	20 in.	22 in.	24 in.	26 in.	28 in.	
% in. and heavier	\$0.90	\$0.92	\$0.93	\$0.94	\$0.95	\$0.97	\$1.00	\$1.05	\$1.10	On application.
Nos. 00 to 8 . . . . .	.92	.94	.96	.98	1.00	1.05	1.10	1.15	1.25	2¢
Nos. 9 to 16 . . . . .	.95	.98	1.01	1.04	1.07	1.12	1.20	1.30	1.50	4¢
Nos. 17 to 20	1.00	1.03	1.06	1.10	1.15	1.20	1.30	1.45	1.55	6¢
Nos. 21 to 24	1.05	1.09	1.13	1.18	1.24	1.30	1.45			8¢
Nos. 25 and 26	1.10	1.15	1.20	1.25	1.32	1.40				11¢
Nos. 27 and 28	1.15	1.22	1.30	1.40						13¢
No. 29	1.20	1.30	1.40	1.50						14¢
No. 30	1.25	1.35	1.50							

Not Wider than 6 Inches.

Nos.	31	32	33	34	35 and 36	37 to 40	0.003 to 0.0015 in.	Less than 0.0015 in.
	\$2.00	\$2.25	\$2.50	\$2.75	\$3.00	\$3.25	\$4.00	\$4.50

Aluminum Wire.—B. & S. Gauge.

Diameter B. & S. Gauge.	Price per pound.
Nos. 9 to 14	\$1.25
Nos. 16 and 17	1.28
Nos. 18 and 19	1.31
No. 20	1.40
No. 21	1.48
No. 22	1.62
No. 23	1.76
No. 24	1.96
No. 25	2.10
No. 26	2.27
No. 27	2.58

Aluminum.—The following are current quotations: No. 1 Aluminum, over 98 % pure, 75¢ per lb in small lots; 68¢ per lb in 100-lb lots; 65¢ per lb in ton lots; No. 2 grade, over 94 % pure, 73¢ per lb in small lots; 65¢ per lb in 100-lb lots, and 60¢ per lb in ton lots.

The Wheeling Corrugating Company of Wheeling, W. Va., will open a warehouse at 472 Laflin street, Chicago, where they will carry a stock of Corrugated Iron Roofing, Siding and Ceiling, Eave Trough and Conductor, and Black and Galvanized Sheet Iron and Steel.

Financial.

The financial situation shows no very marked change from the conditions outlined in last week's report. A slow development in the general business of the country is undoubtedly in progress, but evidence of any extended revival, either at present or in the immediate future, is yet lacking. The feeling in financial and business circles, however, appears to be more hopeful, particularly since the success of the \$50,000,000 Government loan was known to be assured. It was announced on Wednesday evening, after disquieting rumors in regard to the bond issue had been prevalent for some days, that subscriptions for the bonds had been transmitted from New York financial institutions and private bankers to the extent of \$40,000,000, with the prospect of nearly the whole of the available balance being taken up. The successful issue of Secretary Carlisle's action is therefore secure, and it is morally certain that the loan will be oversubscribed in spite of the opposition presented to the scheme in various quarters—Congressional and otherwise. Should the Government receipts in future more nearly balance the expenditures, one of the main causes of the present depression will thus be mitigated—namely, the constant shrinkage of the Treasury balance, which has now gotten down to less than \$80,000,000, of which only \$66,000,000 is "free gold." This de-

January 70 roads reported a decrease of 14.28 %. In the second week of the month 72 roads showed only 10.42 % decrease, and returns received so far for the third week indicate a still further reduction of the average loss, bring it down to about 8.25 %.

The glut of money at this center still continues, last week's bank statement showing a further average gain by the associated banks of \$7,635,600, bringing the surplus of reserves over legal requirements up to the unprecedented total of \$109,043,000. This, of course, reflects continued dullness of business, or out of town banks would not be forwarding their idle funds to this center. This condition is still further emphasized by the fact that loans shrunk over \$900,000 at the same time. The pressure of this large amount of idle money has reduced the rates of interest on loans to very low figures. Call loans on stock collateral are still offered at 1 %, and even lower, while time money is in abundant supply at 2 % for 60 days, 2½ % @ 3 % for three and four months, and 3 % @ 4 % for longer periods up to one year. Such low rates are said to be without precedent, and yet the demand for time money is small. Commercial paper is dull and quiet owing to light offerings of desirable lines of bills. For best indorsed receivables 3 % @ 3½ % is asked; 3½ % @ 4½ % for best single names, and 5 % @ 5½ % for others. The demand for good paper continues large.

In the stock market the tendency has been toward higher prices, although there is not as yet any great demand for stocks on the part of the investing public. Trading has continued on narrow and "professional" lines, with no specially interesting features. At the close of last week favorable railway news operated to strengthen the general market, all issues, with but one or two exceptions, showing upward tendencies. New England was one of the exceptions, that stock declining sharply on Friday and Saturday. Monday's business on the Stock Exchange was rather more lively than usual, London placing some large purchasing orders in the market. Sugar and Chicago Gas sold down some points, but the market generally maintained its strength, which was intensified on Tuesday by the favorable news in regard to New York subscriptions to the Government loan. The market closed strong and buoyant all round. The following list shows the fluctuations during the week of a few of the more active stocks, together with closing prices on January 31:

	High est.	Low est.	Closing Jan. 31
Am. Sugar Ref.	79	75½	76½
Chicago Gas.	66½	61½	64½
Chic., B. & Q.	77½	76½	76½
Chic., Mil. & St. Paul.	60½	58½	59½
Chic., Rock Isl. & Pac.	68½	67	67½
Del., Lack. & Western.	169½	164	166
Gen. Electric.	35½	33½	34½
Louisville & Nashville.	47½	44½	47
Missouri Pacific.	24½	22½	24½
National Lead, Common.	28	26	27½
New York Central.	101½	100½	101½
N. Y., L. E. & Western.	15½	14½	15½
N. Y. & New England.	14½	9½	11½
Northern Pacific, Pfd.	17½	15½	17½
Philadelphia & Reading.	20½	19½	19½
Union Pacific.	20½	19	19½
Western Union.	85½	83½	84½

The general bond market has been active and strong in tone. Railway mortgages are in good demand, and the volume of transactions in these issues shows a marked increase, while prices are generally higher. Government bonds have been in more active sale. The last sales on call were \$22,000 4s

registered at 113 $\frac{5}{8}$ and \$15,000 4s coupon at 113 $\frac{3}{4}$. The closing quotations were:

	Bid.	Asked.
2s, 1891, registered.....	95	.....
4s, registered.....	113 $\frac{1}{2}$	114
4s, coupon.....	113 $\frac{1}{2}$	114 $\frac{1}{2}$

The market for sterling has fluctuated during the week, closing firm on Tuesday with an improved demand from remitters, and a fair supply of commercial bills. Nominal rates were advanced a trifle; and actual business was done at \$4.85 for 60 days, \$4.87 for demand, \$4.87½ for cables and 4.84 for commercial.

Domestic exchange on New York is quoted as follows: New Orleans, commercial 50 premium, bank 100 premium; Charleston, buying par, selling $\frac{1}{2}$ premium; San Francisco, sight 15, telegraph 20 premium; Savannah, buying par, selling $\frac{1}{4}$ premium; Chicago, 50 premium; St. Louis, 50 premium.

Bar silver closed in London at 30 $\frac{1}{16}$ pence and in New York at 66 $\frac{5}{8}$ ¢ per ounce. Shipments of the metal amounting to \$1,100,000 have been made during the past week.

New York.

Office of *The Iron Age*, 96-102 Reade street, }
NEW YORK. January 31, 1894. }

Pig Iron.—Inquiries are somewhat better, and the volume of business has increased, although it has needed the aid of concessions in some grades to stimulate orders. Efforts to contract beyond July for standard brands are cropping up, but are not meeting with any encouragement. Little has been done in the Cast Iron Pipe market, the Quincy, Mass., order going to the Radford foundry at \$22.56, delivered. We quote standard brands \$13 @ \$13.75 for No. 1; \$12.50 @ \$13 for No. 2; \$11.75 @ \$12.50 for Gray Forge, at tidewater. Southern Iron, same delivery, \$13 @ \$13.50 for No. 1; \$11.75 @ \$13 for No. 2; \$11.50 @ \$12 for No. 3; \$11.25 @ \$12 for No. 2 Soft, and \$12 @ \$12.50 for No. 1 Soft. Gray Forge is \$10.75 @ \$11.25.

Ferromanganese and Spiegeleisen. There is no business doing in foreign material. We quote domestic Ferromanganese \$52 @ \$52.50, tidewater, and foreign Spiegeleisen nominally \$21.50 @ \$22 for 10 %, and \$25 @ \$25.50 for 20 %.

Billets and Rods.—Very little business has been done in this market. Steel Billets are \$18 @ \$18.25, tidewater, for domestic, and \$27 @ \$27.25 for foreign. The market for Wire Rods is firmer, and \$26.50 @ \$26.75, tidewater, is now asked for domestic. Foreign are nominally \$39 @ \$40.

Steel Rails.—The Eastern market continues exceedingly dull. The largest sale reported by an Eastern mill is 1500 tons, Portland, Maine, delivery. The Rail manufacturers had a harmonious meeting in this city last week. Prices remain \$24 80, tidewater delivery.

Track Material.—We quote as follows for small lots: Spikes, 1.70¢ @ 1.90¢; Fish Plates, 1.25¢ @ 1.40¢; Track Bolts, Square Nuts, 2.10¢ @ 2.40¢, and Hexagon Nuts, 2.30¢ @ 2.50¢, delivered. Concessions would be made for round lots.

Manufactured Iron and Steel.—The demand is a little better, but as yet no contracts of any consequence have been placed. A few moderate structures are in this market. A 600 to 700 ton contract is soon coming up in Syracuse, and the Rochester court house is soon to be placed. An office building, which

will take about 1000 tons, is soon to be closed in Boston. Plates are dull and extremely low prices have been made in Bar Iron. It is claimed that good Iron has sold at 1¢ $\frac{3}{4}$ lb in this city. We quote nominally: Beams up to 15-inch, 1.55¢ @ 1.75¢; 20-inch, 1.75¢ @ 2¢; 24-inch, 2¢ @ 2.25¢, for round lots; Angles, 1.50¢ @ 1.70¢; Universal Mill Plates, 1.50¢ @ 1.65¢; Tees, 1.70¢ @ 2¢; Channels, 1.60¢ @ 2¢, on dock. Steel Plates are 1.40¢ @ 1.55¢ for Tank; 1.60¢ @ 1.65¢ for Shell; 1.75¢ @ 2¢ for Flange, and 2¢ @ 2.50¢ for Fire Box, on dock; Refined Bars are 1.40¢ @ 1.9¢, on dock, and Common 1.10¢ @ 1.25¢; Soft Steel Bars are 1.30¢ @ 1.50¢; Scrap Axles are quotable at 1.5¢ @ 1.75¢, delivered; Steel Axles, 1.5¢ @ 1.90¢, and Links and Pins, 1.5¢ @ 1.80¢; Steel Hoops, 1.50¢ @ 1.70¢, delivered; Cotton Ties, 70¢ @ 72 $\frac{1}{2}$ ¢ $\frac{3}{4}$ 45-lb bundle, at mill; Machinery Steel, 1.45¢ @ 1.50¢; Toe Calk, 1.90¢ @ 2¢, and Sleigh Shoe, 1.65¢ @ 1.75¢, delivered.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, January 31, 1894.

The movement in prices of Pig Iron has been very moderate and the market has continued quiet, owing to the disturbed condition of Eastern exchange. The lowness of prices attracted some buying for speculative account at intervals, but the support from that source was not sufficient to have any pronounced effect upon the market. Since the fall in silver prices neither speculators nor other buyers have shown any inclination to operate freely. The market at the close of the week was rather soft, with Straits quoted at £70.17/6 @ £71 for prompts and £72 for forward delivery.

Copper has been remarkably steady. Not over 5/ fluctuation in prices has taken place. There was some depression early in the week owing to the poor condition of the market for Silver and Tin, but since then a steadier tone has prevailed. Improvement in shipbuilding, Iron and other industries is causing sellers to be more reserved and also prompted some covering of "short" accounts, besides a fair amount of buying for speculative account. Rather adverse accounts from America have, however, stood in the way of any decided improvement in prices. Late dealings in Merchant Bars were at £41. 5/ @ £41. 7/6 for prompts and £41. 15/ @ £41. 17/6 for three months' futures. Best Selected English quoted at £44. 10/ @ £45.

Business in Tin Plate has been rather small, and the demand is spiritless at the present time. Terms are virtually neglected. There has been hardly any change in prices during the week. Stocks at Swansea are now about 260,000 boxes. There is more inquiry for Black Plates for direct shipment from Swansea, and prices are rather steadier. Liverpool prices are quoted as follows:

IC Charcoal, Alloway grade.....	12/3 @ 12/9
IC Bessemer Steel, Coke finish.	11/ @
IC Siemens " " " " " " " " " "	11/3 @
IC Coke, B. V. grade, 14 x 20.	11/ @
Charcoal Terne, Dean grade.....	10/6 @

Pig Lead has been selling in moderate quantities only, but the market shows rather better tone, with £9. 5/ quoted for ordinary Spanish.

Spelter has undergone hardly any change in price, and the market remains quiet, with sellers at £16. 2/6 for ordinary Silesian.

More activity in shipbuilding has stimulated some branches of the Steel trade and also helped the market for Finished Iron. This in turn stiffened Pig Iron prices and led to an advance in warrants. There is a better demand also for Old Material. Latest transactions in warrants were at 43/8 @ 43/10 for Scotch, 36/ @ 36/3 for Cleveland and 45/6 @ 45/9 for Hematite.

Arthur W. Brown, vice president of the Cambridge Iron & Steel Company, Cambridge, Ohio, has assumed double duties, having been appointed general manager of the Ellwood Steel Company, Ellwood, Pa. As previously stated in *The Iron Age*, the works of this company were recently bought for stockholders by Mr. Brown at assignee's sale. The plant is modern in every particular, and is ready for operations at any time. In view of the general condition of trade no definite arrangements have been made regarding resumption of operations. At Cambridge a great deal of talk has been indulged in regarding the probability of moving the plant from Ellwood to Cambridge, but no authoritative statements have been made. The Cambridge mills are running to full capacity.

From the West comes the information that the Ontario Natural Gas Company of Kingsville, Ontario, Canada, have placed an order for some 60 miles of line pipe. The order is made up of about 40 miles of 8 inch, 5 miles of 6-inch, 10 miles of 4-inch and 10 miles of 3 inch, and the contract is said to amount to close to \$175,000. The business has been taken by the American Tube & Iron Company, with mills at Middletown, Pa., and Youngstown, Ohio, and was awarded to that concern on the merits of the Matheson patent lock joint, of which the above concern have exclusive control. This joint will be used only on the 6-inch and 8 inch sizes. This is one of the largest contracts for pipe that has been placed in some months, and the competition among the pipe makers to secure it was very severe.

The sharpest cut in the rates of duty just made by the Ways and Means Committee in the metal schedule is that on scrap iron and steel, which has been reduced from 22½ per cent. in the original draft of the bill to 10 per cent., the present rate of duty being \$6.72 per ton. The committee has been apparently oblivious of the fact that old iron rails and scrap iron come into direct competition with mill pig iron in the manufacture of bars and many shapes. At so low a rate on scrap, the works near tidewater would become, like the Canadian mills, mere converters of scrap into rolled forms.

F. J. V. Skiff, who was chief of the Mines and Mining Department at the World's Fair, has been appointed director-in-chief of the Columbian Museum.

Actual vs. Apparent Economy.

Whether a certain purchase for or improvement in the manufactory will prove to be economical in its results is often very difficult to determine. Even judgment based upon continued use may not always be accurate, and the known saving at the spigot may be more than counterbalanced by the unknown waste at the bung-hole.

The well informed superintendent or engineer is often saved from disastrous financial results solely by his knowledge of the experience of others with schemes or machines that upon the face bore every evidence of assured actual economy, but in practice proved exactly the opposite. So, too, in buying such articles of constant use as oil, belts, coal, waste and the like, only extended experience or careful investigation will lead to avoiding the purchase of material because it is cheap and not because of its known efficiency or wearing qualities.

Just how long it shall take a machine to pay for itself in the saving that results from its use in order to prove an economical investment is, of course, open to discussion, but it is certain that many special machines have been purchased with actual resulting loss to the purchaser. And this not because the special machine did not come up to the guarantee of displacing a stated number of lathes or planers, but because of lack of work for it to do and the consequent loss on the interest account while it remained idle.

Changing the form of a pattern in order to save metal in the casting frequently appears like an excellent economical move, but when the proportionate cost of a new pattern per casting made, perhaps accompanied by an increase in the labor of molding, is fully considered, the balance is frequently found to fall upon the wrong side. Speeding up an engine in order to obtain a larger output for the given investment is all right until the point is passed above which the speed tends much more rapidly to destroy the engine, and thereby reduce its "horse-power hours" capacity for running.

Low priced pattern lumber looks cheap upon the bill, and its cheapness is not to be discerned in the lump sum cost of the patterns, but nevertheless the extra time spent in trying to get out good pieces together with the resulting waste will almost always prove the highest priced lumber to be the cheapest.

Apparent economy is most likely to appeal to the business man, while the actual economy is only discerned by the engineer or superintendent, who is brought into intimate relations with methods and results. It therefore becomes the mechanical man to be diplomatic, if he wishes to secure certain improvements and has to deal with a man who looks only at the dollars and the immediate results.

The engineer may determine in his own mind upon the desirability and the assured economy that will result if certain expenditures are made. But in many cases it will be well for him to present only a portion of his scheme at once. He may plan out an entire remodeling of the establishment; but if he has to deal with men who cannot see the assured results of the improvements it behooves him to change a little at a time, to show clearly the actual economy resulting and thereby beget confidence in his sagacity and ability.

A short time since it was reported in a mechanical journal that a certain machine manufactory had, through the employment of an expensive but thoroughly experienced man, by the simplification and standardizing of

designs, and by making an extensive line of jigs and templates, reduced by one-half the cost of manufacture of the given machines. Whether this was actual or apparent saving did not appear; but the comparison between old and new methods could not be fairly drawn without making due allowance for the increased salary list and the interest on and depreciation of the special tools.

OBITUARY.

GEORGE H. ELY.

George H. Ely of Cleveland, whose sudden death at Washington we announced last week, was born in Rochester, N. Y., on October 18, 1825, his father, Elisha Ely, being one of the founders of that city. He entered Williams College in 1846 and was graduated from that institution two years later, returning in 1851 to receive the degree of Master of Arts. He soon afterward removed to Cedar Rapids, Iowa, to take charge of the estate of his deceased brother, Alexander L. Ely, which comprised a large flouring mill and extensive landed interests. He returned to Rochester two years later to engage actively in flour manufacturing, and he remained there for a period of seven years. The possibilities of the Lake Superior iron mines attracted his attention, and after a careful study of the subject he decided that a large field for enterprise lay in that direction. It was seen that railroad facilities were needed first of all, and together with his brothers, Samuel P. Ely and Heman B. Ely, he built a railroad leading from the mines toward civilization. This enterprise was completed in 1857 and after operating a short time as the Iron Mountain Railroad was absorbed by other lines. Numerous changes took place in the rapidly developing region and that road and many other short lines constructed there are now a part of a great railway system. Mr. Ely came to Cleveland in 1863 and became a partner of H. B. Tuttle, who had been the Cleveland representative of the company which the Ely brothers formed, this partnership continuing until Mr. Tuttle's death in 1878. Then Mr. Ely entered into partnership with his brother, under the name of George H. and S. P. Ely, the iron business being greatly developed by them. The Mayor of the city appointed George H. Ely a delegate to the national railroad convention held in St. Louis in 1877, to advance the construction of the Texas & Pacific Railroad across the Continent. The Cleveland Board of Trade sent him as its representative to the lake improvement convention at St. Paul, and that body chose him as its president and commissioned him to go to Washington and advocate the improvement and enlarging of the St. Mary's River and the completion of the lock and canal at the "Soo." He was president of the Western Iron Ore Association and was recently elected a vice president of the American Protective Tariff League.

JOSEPH LIVESSEY.

Joseph Livesey, an old resident of Chicago, died at his home on January 15, after a lingering illness. Mr. Livesey was born in Lancashire, England, 79 years ago, and settled in Chicago in 1851. He was connected with the first locomotive iron works established in the city, and later was for many years the senior member of the Livesey Iron Works. For the past ten years he has not been in active business.

Pittsburgh Freight Rates.

(By Telegraph.)

Taking effect on February 5, freight rates on articles of iron and steel from Pittsburgh and points taking Pittsburgh rates on westbound shipments will be reduced from fourth and fifth to fifth and sixth classes. Bar iron, Pittsburgh to Chicago, will be reduced to 15 cents in carloads and 17½ cents in less than carloads. Similar reductions on eastbound shipments from Pittsburgh will likely be made at an early date.

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HARDWARE.

Condition of Trade.

OUR READERS will observe that in the special reports which follow there is a general agreement in referring to the improved condition of business. There is certainly in many lines an increased demand, and in general Hardware the trade are beginning to place orders more freely than for some time. The volume of business is, however, only moderate, but the fact that it is increasing is an excellent indication and all that can be expected under the circumstances, inasmuch as the gradual improvement and return to normal business conditions is all that can reasonably be looked for. In the matter of prices it is noticeable that there is apparently a slight reaction from the extremely low figures which have ruled on some staple goods. In the general line of Hardware the market is not strong, and the effect of low raw material, reduced wages and dull business is shown in the prices on some goods. The influence, however, of diminished production in relatively increased costs is felt, and with a moderate volume of business manufacturers find that they cannot produce goods as cheaply as when running to their full capacity. They are also scrutinizing their costs closely and are more careful than has been their wont to secure remunerative prices. The financial condition is certainly more satisfactory than for a long time, and February, on the whole, opens with a brighter outlook than any month during the past half year.

Chicago.

(By Telegraph.)

The Shelf Hardware jobbers report a steadily increasing trade. The bulk of this business is still in the line of orders for future delivery for seasonable goods and for stocks of staple goods. Country merchants are becoming convinced that staples may be higher and are buying as though they believed an advance was imminent. Their orders are consequently more numerous and heavier than for a long time and carry with them some straight Hardware for sorting up. Some large jobbing houses are reporting good trade in regular Hardware, but it is shrewdly surmised that the business thus secured is at the

expense of prices. The heavy Hardware trade is spasmodic, days of excellent business being followed by periods of dullness. The general average, however, shows an improving condition of affairs, which will undoubtedly gain in strength as spring approaches.

St. Louis.

(By Telegraph.)

There continues to be a heavy demand for Hardware, particularly shelf goods. Builders' Hardware has had a boom in the letting of the Planters' House contract, which was secured by the Heckel Hardware Company, as referred to in detail in another column. Wire Nails are being subjected to some trying tests, principal among which is the price, \$1.10, made by a local house for any quantity up to 25 kegs. Barb Wire is firm, with a possibility of an early advance. Reports received from salesmen show that retailers throughout the country are carrying lighter stocks than at any time for years. The spring trade promises to be unusually heavy, and these dealers will doubtless need goods. When they reach that point they will want them quickly, and the jobber who has the stock will fill the orders. Bicycles are to be pushed harder than ever, and many sample orders are now being received. Collections are excellent.

Boston.

BIGELOW & DOWSE COMPANY.—There is no marked change to note either in the volume of business or in the feeling of confidence in the future. Most of the orders taken this month are for future deliveries and they will compare favorably with those of last year.

Prices are very low and the competition for orders is greater than for many years past. The fact that many mills are starting up that have been idle for the past two months or more should have a beneficial effect later. A settlement of the tariff agitation would have an immediate effect for the better. If Congressmen would look more to the interests of the business community and less to politics we would all be better off. Every one wants the tariff question settled either one way or the other. The worst that can be done is better than this uncertainty.

The manufacturers and the dealers are playing football with Galvanized Barbed Wire and Poultry Netting. Desirable orders for the former are easily placed at 2 cents, f.o.b. Pittsburgh, and the latter is being sold at 80 and 10 and 10 per cent. delivered.

Most of the larger retail dealers have already placed their spring orders for Wire and Steel Cut Nails at the lowest price they ever reached. Remittances are satisfactory.

Baltimore.

CARLIN & FULTON.—Since our last letter we have little to report that is new. Orders are numerous, but confined mostly to heavy staples, and are for goods wanted to fill immediate demands, showing that the dealer and consumer are in close touch, and that the already depleted stocks are not being largely increased.

The uncertainties and surprises in national legislation act as a clog upon general trade, and all interests are clamoring for speedy action and wondering whether the tariff bill is strong enough in popularity to carry the income tax feature as a rider, or whether the opposition to the latter will result in the defeat of the whole bill.

From the far south our men write that though trade is dull collections are fair, and that there is a "better feeling," and we hope that this emotional condition will result in what we are all looking for—better trade.

Omaha.

LEE-CLARKE-ANDRESEN HARDWARE COMPANY.—January draws to a close without any remarkable increase of activity in the Hardware trade. The situation remains practically as it has been for some little time past, and it appears to be evident that whatever improvement is to be anticipated will materialize but slowly; still, the results so far this year, while not flattering, are not of a nature to invite despondency. But because the country merchants are buying sparingly it does not follow that they are doing no business, but it discloses an intention not to increase obligations unless absolutely necessary. This feeling of caution is to be commended and it is the proper policy to be pursued, at least until spring opens, when building and field operations must necessarily commence. Conservatism therefore is not only to be expected at this time, but it is wise.

While spring goods are not moving off as early as usual, there are some reassuring indications. The improvement is slow, the progress by cautious steps, but it is noticeable.

Collections are growing better rather than worse, and the retail dealers generally are evidently doing business on a basis where they can pay reasonably promptly for what they order.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—There is not much to note in the Hardware trade. Travelers are out and are sending in orders, mostly small, showing, as suggested in our former reports, that dealers are disposed to provide only for immediate needs. The fact is that the low price of wool, the large losses and short price in wheat last fall and the depreciation in value of live stock have combined to make the agriculturalist very sick. Whether the hard times and general depression of spirits have stimulated the demand for beer or not, the hop growers seem to have been the only ones who were exempted from the general gloom.

Farmers who were left in debt to their merchants at the end of harvest do not want to necessarily increase their liabilities, nor in fact does the merchant wish to have his outstandings swell until the time when some calculation can be made of wool clip and wheat crop.

While, therefore, the ground taken in your editorial on the "Condition of Trade," in issue of 11th ult., is largely correct, yet there will of necessity be in many places a starving of stocks for the next few months.

: Cleveland.

THE W. BINGHAM COMPANY.—That there is a distinct improvement in trade there can be no doubt. The conservatism of buyers is still apparent, but orders are more numerous and larger than they have been for some time and compare very favorably with a year ago. Orders for Wire Cloth, Screen Doors, Agricultural Implements, &c., are coming in very freely, and there is no doubt there will be a scarcity all along the line in these goods when the season is upon us.

Prices since the first of the year have shown somewhat of a weakness, but are improving. Tack manufacturers have adjusted their differences and have advanced their prices very materially, and the jobbers here are getting the advances. The demand for Wire and Nails is quite large, and the mills are all filled with orders and running full. Prices on these commodities are much firmer, and there is no doubt but that an advance may be looked for very shortly. The most encouraging sign of improvement is the starting up of the factories hereabouts, and the many inquiries from those that are getting ready to start. Money is plentiful in this market. Collections are very fair.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—At the close of the first month of the year there is little to mention as worthy of special notice. The winter has been pretty severe, being one of the old fashioned Minnesota winters, but it is more favorable for business than an open one, and business men are glad to see it.

Trade has picked up a little. The traveling salesmen are in the field to a considerable extent, and while the volume of trade is smaller than usual it is fully up to expectations. Retail dealers are buying on the hand-to-mouth policy, and orders will doubtless continue to be small, even for seasonable goods.

Ordinarily it is supposed to be to the interest of the jobber to secure large orders early from many of his customers, but there can be no doubt of the advantage to the retail merchant of purchasing only for immediate wants, and so making smaller orders and ordering more frequently. The merchant who places speculative orders ahead for goods for which he may not have a demand is handicapped from the start in these days, when orders can be filled and the goods received so quickly, as contrasted with his shrewder competitor, who orders only for actual wants and who watches his stock closely and replenishes it as he sees it is needed. The latter is ahead in half a dozen different ways, and his policy is the one that will win.

On prices there is little to note. Generally there is little change. A few articles have advanced largely and Wire Nails, on the other hand, have beaten the record on the decline. The present price on them would have

been considered incredible one year ago.

But on the whole prices are well held and the probabilities are that they will grow firmer as the spring trade approaches, unless disturbances from the tariff question shall prove more serious than expected, and it is devoutly to be hoped that this aggravating factor in the business situation has been already fully discounted.

New Orleans.

A. BALDWIN & Co.—Business continues very brisk in this section, and merchants are busy supplying the wants of the various customers. Bright, pleasant weather has helped the matter considerably, and a great many of the planters are making very active preparations for the coming crop.

Wire and Nails are moving in very large quantities. Perhaps the extremely low price has a great deal to do with it. The demand for spring goods is much larger than we anticipated, and the general situation is very satisfactory, much more so than we looked for at the beginning of the year.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—The black cloud of trade depression which has hovered over our country for the last six months is far less black than it was during the last month of 1893, and certain breaks are visible through which the clear blue sky is quite noticeable. Trade has improved during the last two weeks. Salesmen have met with a more cheerful welcome when entering their customers' stores or offices whose shelves show depleted stocks, and there is a certain desire on the part of customers to replenish those starved stocks. The resumption of mills and factories is daily increasing and overshadows the closing of others. Competition has ceased to induce a continuation of work, however, unless at a price which will show a profit, and mills are not likely to resume until orders are taken which guarantee a profit over the cost of production. This we look upon as a healthy state of affairs.

The anticipation, on the part of an occasional customer, of lower prices at the opening of the new year on general Hardware than the rock bottom prices which have been reached through aggressive competition during the year 1893 is not likely to be realized. Enlarged capacity and output naturally has the effect of reducing prices by the manufacturer; and when manufacturers, in order to increase their maximum output, have reduced their profits to a minimum, further declines are not likely to occur.

Manufacturers whose output has reached anywhere from \$500,000 to \$1,000,000 have been satisfied when the net profit shows, say, 3 per cent., but when you reduce their sales say one-half, it is plainly seen that it requires 6 to 8 per cent. profit net of the output to bring in the necessary revenue in order to cover interest on capital invested, bad debts deducted, and depreciated or discarded machinery, to which must be added the salaries of officers, clerical force, and superintendents. Therefore, it will require the difference in percentage of net profits in order to recoup themselves. Besides there is an expense of keeping idle machinery in proper condition, and it is a well known fact that idle machinery deteriorates in value, therefore double the amount of net profit when sales are reduced one-half would hardly be a legitimate esti-

mate. What reason can, therefore, be given for lower prices if they have already reached the minimum point of safety?

We admit in former years sales have been frequently made at less than cost, in order to realize cash for anticipated payments coming due; but this class of manufacturers, as a rule, have been compelled to adjust all bills payable, or loans, by either reduction in material and stock on hand, or by mortgages on their establishments, so as to place themselves in safety during the recent tidal wave of uncertainty. Therefore, it would seem but natural, upon the advent of business revival, that an advance may be looked for in many instances. The only possible reduction can now be a reduction of wages, but it will require a material reduction to overcome the defects shown above.

The same rule holds good regarding the wholesale merchant. The volume of trade, as a rule, determines the ability to distribute goods at a small margin of profit. This problem has been solved within the last few years. As an illustration, let his sales reach anywhere from \$500,000 to \$3,000,000 per annum. He so conducts and arranges his business that a net profit of 2½ per cent. on net sales is a fair return for capital, but reduce this business one-half, with practically the same expense account, and you reach a danger line; therefore, the entire business must be reorganized on a smaller basis, with reduced capital, or a larger profit is necessary.

The fallacy of large manufacturing or mercantile establishments being a disadvantage to the consumer has long since been exploded. The fact is that business of all kinds, within the last few years, has been conducted on a plan to increase the maximum point that the minimum point of profit may be reached, and in this the consumer and retail dealer have the benefit.

Congressional discussions have to a great extent ceased to interest the Hardware dealer, for, outside of Guns and special makes of Pocket Cutlery, like Wostenholm and Rodgers, nothing can be affected materially by any change in tariff. Advances in Cutlery, outside of well-known makers whose goods sell on reputation alone, will occur in Europe simultaneously with any change in tariff, for the reason that wages abroad were reduced with our last tariff changes.

This is realized and has been discovered by those who have made a study of these matters during the last six months, and the estimate has been made that on cotton and woolen fabrics as a rule 75 per cent. is a fair estimate for labor alone, 15 per cent. for material and 10 per cent. of profit to the manufacturer, so it is plainly seen that any reduction to meet any different tariff changes must fall upon the workmen, and it will be observed now that in 99 cases out of 100 where mills have started up they have done so on a reduction in wages of from 15 per cent. to 30 per cent. thus far, not from the effects of the tariff changes but from reasons given in the earlier portion of this article—reduced output without corresponding reduction of expense account.

The discussions in the papers which have gone on for the past few months have enlightened many persons on this subject, who acknowledge they have heretofore been thoroughly in the dark.

The changes in prices of a few leading goods are owing to special causes, which causes have borne hard on the manufacturer. We refer especially to prices on Barb Wire, Wire Nails and Wood Bench Planes.

Collections of accounts carried over from the year 1893 come in slowly. Settlements of new accounts will come

in under a new era, as parties who are now buying are doing so with caution and with an eye on their bank account, keeping in view the fact that starved stocks mean a loss of trade.

We have hopes for the future if all would think alike on this point, and if possible forget the fact that Congress is in session, or if not possible to forget that, then call to mind the fact that Congressmen are sent to Washington to represent the interests of their constituents, and when their actions are detrimental to business interests, see that they do not go there again when their present term of office expires.

Orders for seasonable goods, in advance of wants, like Barb Wire, Wire Nails, Green Wire Cloth, Poultry Netting and Ice Cream Freezers, are being freely placed, although there is a visible effort on the part of the jobber to avoid taking orders for the first four named articles.

Louisville.

W. B. BELKNAP & Co.—We are glad to report at last a decided improvement in business. Seasonable weather, a recognized cash purchasing power in the country, depleted stocks, a reduction in manufactured output to what is apparently below the demands for consumption, a sound currency basis and reasonable tariff bill as proposed, all conspire to make us believe that the improvement will be steady and satisfactory. Those who are equipped for doing work economically will probably not be disappointed in the year '94.

Barb Wire is in urgent demand, and an advance has been fairly established.

The number of unemployed in the cities we think is decreasing, as factories are starting up on part time at least. Two untoward conditions, however, might be mentioned.

1. The extravagances of municipal corporations, the creation of useless offices with large salaries and fees attached, such as inspectors of every imaginable kind and their assistants, the increase of salaries and fees in those already established, despite the times and the necessities of economy in every quarter.

2. The tendency on the part of State legislatures to practically confiscate railroad property, by giving commissioners such power as to take the property out of the hands of its owners or their appointed representatives. This latter seems to us such a menace to American institutions that too much stress cannot be laid upon it. Better far suffer an occasional wreck and go through with liquidation and reorganization of a great system like the Atchison than foster the idea that business people cannot look after their own interests, and that the Government is the best depository of all trust.

Notes on Prices.

Wire Nails.—The Wire Nail market is evidently in an improved condition, both in the matter of demand and prices. The manufacturers have recently been booking many orders, some of them large, and as a result the mills are well occupied. They are also receiving many inquiries, and orders continue to come in in good volume. Buyers are evidently attracted by the low prices ruling, and the improved tone of the market is likely to have the effect of making them desirous

of placing their orders before a more definite advance in prices is made. In this condition of things the market has naturally assumed a stronger tone, and manufacturers refuse to accept orders at prices which were quoted a short time ago. The market continues to be represented by the quotation of \$1.10, from which price a concession of 5 cents is made on large and attractive orders. During the past week some large orders have been placed at \$1, but this is regarded as the lowest price obtainable, and it is one which some manufacturers refuse to meet. Manufacturers are anticipating a continuance of the demand for the next month or two, and refer to the probability of an advance in prices. The New York market is represented by the quotation of \$1.20 on dock, and small lots from store are held at \$1.25 to \$1.30.

Chicago, by Telegraph.—Prospects are very bright for an unusually heavy business in Wire Nails in at least February and March. A great many buyers are in the market, and among them are some very large houses whose requirements for the spring have not yet been covered. Makers are greatly encouraged by the increase in inquiries and are advancing their prices. It is known that a 25,000-keg contract was declined last week by a manufacturer at an offer of 1 cent below his price. Quotations on factory lots are now \$1.20 to \$1.25, Chicago, and more than one factory is stated to be so well sold up as to be practically out of the market. Jobbers are quoting \$1.25 to \$1.30 from stock, but an advance may be expected at any time in consequence of the heavy demand.

Cut Nails.—The Cut Nail market, under the influence of the same causes that affect Wire Nails, is in a somewhat improved condition. Trade, without being especially active, shows evidence of a decided increase and prices are also somewhat firmer without being notably higher. The Western market is represented by the quotation of \$1 to \$1.05 at mill. The Eastern Cut Nail manufacturers are adhering closely to the agreement in regard to discontinuing quotations at factory, and are naming only prices for Nails delivered. The New York price is \$1.05 for carload lots on dock, with the usual advance on small lots from store.

Chicago, by Telegraph.—Business in Steel Cut Nails grows better steadily, and while orders have not been so large as in past years, they are coming in more frequently. Merchants find it necessary to replenish stocks faster than they had expected. This is leading to inquiries for larger quantities. Prices here on factory lots are now \$1.05 for a 60-cent average. Jobbers quote small lots from stock at \$1.20 to \$1.25.

Barb Wire.—An increased activity is noticeable and manufacturers refer to the fact that they are receiving many

inquiries, which leads them to anticipate an active trade during the next few weeks. Prices remain in substantially the same condition as a week ago, some manufacturers holding carload lots of Galvanized Four Point at mill at \$2.10, while from others the Wire can be obtained at \$2. The tone of the market is, however, a little stronger and manufacturers show a disposition to withdraw extreme quotations.

Chicago, by Telegraph.—The inquiry for Barb Wire is very much heavier from merchants through the West. They have held off so long that they are now finding themselves obliged to buy just as they need the goods. Large buyers report that factory prices have stiffened here at least \$1 per ton. Prices have also been advanced \$3 to \$4 per ton on shipments south of the Ohio River. The trade is looking for a further advance at an early day if the present volume of business keeps up. Carload lots of Galvanized are quotable at \$2.20 to \$2.25, while small lots from stock are selling at \$2.30 to \$2.40.

Bright Wire Goods.—The prices of Bright Wire Goods are somewhat uneven, and with the active competition between the manufacturers prices are low, the discount of 90 per cent. being readily obtainable.

I X L Scale.—The I X L Scale, manufactured by the Southwark Scale Company, Philadelphia, Pa., an illustrated description of which appeared in *The Iron Age*, January 25, 1894, is sold at a discount of 50 per cent. from their revised list prices.

Tack Hammers.—The Ladies' Perfect and Alaska Tack Hammers, illustrations of which were given in *The Iron Age*, January, 18, 1894, are manufactured by the Troy Nickel Works, Troy, N. Y. Both Hammers are sold at a list price of \$44 per gross, subject to the following discounts:

	Per cent.
Ladies' Perfect.....	25 and 10 and 10 and 10
Alaska.....	55 and 5 and 2½

Screw Plate.—Card's Improved Screw Plate, manufactured by S. W. Card & Co., Mansfield, Mass., an illustration of which appeared in *The Iron Age*, January 25, 1894, is sold at a discount of 33½ per cent. from their list prices, as printed in their 1894 catalogue.

Hardware Specialties.—The Frog Spear, Tracing Wheel and Cork Extractor, manufactured by the Union Mfg. & Plating Company, Freeport, Ill., and illustrated in our last issue, are sold at the following net prices:

	Per dozen.
No. 23 Frog Spear.....	\$1.50
No. 11 Double Adjustable Tracer.....	0.75
Arcade Cork Extractor.....	27.00

Enterprise Coffee, Spice and Drug Mill.—The Enterprise Coffee, Spice and Drug Mill, an illustration of which was given in our last issue as manufactured by the Enterprise Mfg. Company of

Philadelphia, Pa., is sold at \$3.50 each, from which a discount of 20 per cent. is allowed.

Hand Crimper.—Blumer's Hand Crimper, manufactured by Peck, Stow & Wilcox Company, 27 Chambers street, New York, and illustrated in *The Iron Age*, January 25, 1894, is sold at \$2 50 each, net, or \$27 per dozen, net.

Gibbs Mfg. Company.—Gibbs Mfg. Company, Canton, Ohio, are quoting the following net prices on their line of Lawn and Garden Rakes, Post Hole Diggers, &c.

Lawn Rakes.		Per doz.
The Gibbs	.....	\$4.90
Gibbs' Canton	.....	3.75
" Favorite	.....	3.90
" Acme	.....	4.75
" Crown No. 1	.....	4.90
" Crown No. 2	.....	5.30
" Hustler No. 0	.....	4.25
" Hustler No. 1	.....	4.40

Garden Rakes.		Per doz.
Gibbs' Boss No. 14	.....	\$2.95
" No. 18	.....	3.10

Post Hole Diggers.		Per doz.
The Gibbs	.....	\$12.75
Gibbs' Columbia	.....	12.00
" National	.....	12.00
" Hustler	.....	10 00
" Imperial	.....	7 50

Lawn Sprinklers.		Per doz.
Gibbs' Arc	.....	\$12.00
" Hustler	.....	6.00

Curry Combs.		Per doz.
Gibbs' Magnetic	.....	\$2.00

Wringers.—The National Wringer Mfg. Company, Canton, Ohio, have issued a catalogue of Wringers on which the following net prices are quoted, terms 60 days, subject to a discount of 2 per cent. for cash in ten days, delivered to any part of the United States:

No.	Per dozen.
20, Erie, 10 inch	\$23.00
30, " 11 "	26.00
55, King, 11 "	27.00
2, " 7, 10 "	15.50
2, Zenith, 10 inch	16.50
3, " 11 "	18.50
4, " 12 "	21.50
40, Prime, 10 "	20.10
50, " 11 "	23.00
66, Columbia, 11 x 1 3/4 inch	27.00
99, Pittsburgh, 11 x 2 "	30.00

Daisy Rat Traps, manufactured by the company, are subject to the same terms, and are sold at \$10 per gross.

Whipple Screwless Door Knob.—The Perry & Whipple Company, New Haven, Conn., issue a catalogue devoted to the Whipple Screwless Door Knob, in which prices are given on a large variety of finishes. The list prices for the entire line are subject to a discount of 60 and 10 and 5 to 60 and 10 and 10 per cent. The special features of this Knob are shown on another page.

Hydraulic Pump.—The Hydraulic Spray Pump, manufactured by F. E. Myers & Brother, Ashland, Ohio, of which an illustration was given in *The Iron Age*, January 25, 1894, is sold complete at \$40 each, from which a discount of 50 per cent. is allowed.

Combination Haft.—The improved Henry Combination Haft, manufactured

by Horace E. Britton, Stoughton, Mass., an illustrated description of which appeared in *The Iron Age*, January 18, 1894, is sold at \$6.50 per dozen, net.

Shot.—Another decline in the price of Shot is announced by the manufacturers under date of January 29. Following are the revised prices, terms 30 days, or 2 per cent. discount for cash in ten days from date of invoice:

	Per bag.
Drop Shot, sizes smaller than B, 25 pound bags	\$1.25
Drop Shot, sizes smaller than B, 5-pound bags	.35
Drop Shot, B and larger sizes, 25-pound bags	1.50
Drop Shot, B and larger sizes, 5-pound bags	.40
Buck and Chilled Shot, 25-pound bags	1.50
" " " 5-pound "	.40
Dust Shot, 25-pound bags	2.00
" " " 5-pound "	.45

In lots of 2000 pounds and upward taken at one time a discount of 5 cents per bag (25 pounds) will be allowed, together with a special discount of 2 1/2 per cent.

Stretcher Attachments.—The Wire Stretcher attachments for Button Pliers, manufactured by J. M. King & Co., Waterford, N. Y., an illustrated description of which appeared in *The Iron Age* January 18, 1894, are sold at a list price of \$3 per dozen, subject to a discount of 10 to 15 per cent., according to quantity purchased.

Glass.—It is seriously questioned whether there will be any concerted action among American Window Glass manufacturers regarding the closing down of all factories on February 10, as it is necessary to gain the assent of 85 per cent. of all the pots to make the agreement binding. Pittsburgh quotations indicate that sales of Glass have been made at the following prices from factory: Single strength, 85 and 10 and 2 1/2 per cent. discount; double strength, 85 and 20 per cent. discount. Single strength stock Glass, it is understood, has been offered by factories to New York jobbers at a trifle lower price than Pittsburgh quotations. There appears to be anxiety on the part of makers to book orders for immediate delivery. A Western jobbing house quoted, under date of January 15, as follows: 85 and 2 1/2 per cent. discount for single strength Glass, in lots of at least ten full boxes; 85 and 5 per cent. discount for double strength Glass. Imported Window Glass is quoted at 80 and 10 and 10 and 5 to 80 and 15 per cent. discount. Imported Plate Glass is quoted at 70 and 5 to 70 and 10 per cent. discount. The price of American Plate Glass is low in proportion.

South Dakota Retail Implement Dealers' Association.

OVER a hundred of the retail implement dealers of South Dakota assembled at Sioux Falls on the 11th and 12th ult., and organized themselves into an association known as the South Dakota Retail Implement Dealers' Association, with the following officers: M. R. Baskerville of Watertown, president; John McArthur of Aberdeen, first vice-president; E. B. Van Alstine of Mitchell, second vice-president; M. F. Campbell of Redfield,

third vice-president; C. D. Scott, Sioux Falls, secretary, and W. D. Roberts of Sioux Falls, treasurer. The members passed a resolution recommending the boycotting of the wholesale dealers who sell their goods too cheap, irresponsible brokers who cut prices.

Exhibit of Whips.

AMERICAN WHIP COMPANY have removed the large show-case in which their extensive line of Whips was exhibited at the World's Columbian Exposition, Chicago, together with its contents, to their New York headquarters, 54 Warren street. A series of lights as in picture galleries have been arranged in front of it to properly show the elegant specimens within. There are Whips for driving and riding, suitable for buggy, tandem or four in hands, Crops, Handles, &c. The mountings are in skins of the alligator, shark and lizard, in combination with gold, silver, mother of pearl, ivory, walrus, buck horn, bare bone, &c. There are Driving Whips at from \$5 to \$200, Riding Whips from \$5 to \$75 and Crops from \$3 to \$500 each. The entire outfit is valued at \$10,000. Two Driving Whips which have been sold, priced at \$80 and \$160 each, are especially fine. The first was of holly, with handle of pearl exquisitely inlaid with gold. The other was mounted in ivory and silver, studded with small brilliants. A Crop valued at \$90 is of one piece of ivory, representing a dog's head with rabbit in mouth. The gem of the collection, however, is a Crop, also of one piece of ivory, richly carved, showing a deer pursued by two hounds. This piece is priced at \$500.

Germantown Tool Works.

GERMANTOWN TOOL WORKS, 518 Commerce street, Philadelphia, have recently made additions of several lines of new goods and of new sizes to their lines of Hammers, Hatchets, &c., as shown in their new catalogue, to which we have already referred. The new goods include the following:

Engineers' Hammers, nickel plated, ball pein, sizes ranging from 2 1/2 oz. to 3 lb. 4 oz.
Prospecting Picks, 1 lb. 2 oz. and 1 lb. 10 oz.
Polished Brick Hammers, 1 lb 8 oz.; 1 lb 14 oz., and 2 lb 4 oz.
Blacksmiths' Cold Chisels, No. 500.
Star Chicago Lathing Hatchets, No. 290, size 2.
Star Bell Face Lathing Hatchets, No. 295, size 1.
Star regular pattern Lathing Hatchets, No. 310, size 5.
Full polished, round neck Lathing Hatchets, No. 297, size 2.
Boston pattern, full polished Lathing Hatchets, No. 302, size 2.
Boston pattern, ball face, full polished Lathing Hatchets, No. 311, size 2.
Haines' pattern, full polished Lathing Hatchets, No. 312, size 1.

Among the new sizes of Hammers are the following:

Patent Adze Eye Nail Hammer, No. 34, 11 oz.
Patent Adze Eye Nail Hammer, No. 40, 10 oz.
Patent Adze Eye Nail Hammer, No. 42 1/2, 10 oz.
Prospecting Hammer, No. 190, 1 lb.
Polished Ball Pein Engineers' Hammers, No. 155, 2 1/2 oz.; No. 156, 4 oz., and No. 157, 6 oz.

File Manufacturers' Association.

AT A MEETING of the File Manufacturers' Association of the United States, held in New York, January 25, 1894, a committee was appointed to recommend appropriate action upon the death of William T. Nicholson. Such committee reported the following minute, which was adopted, with directions to the secretary to send a copy to the family of the deceased, to the Nicholson File Company and to *The Iron Age*:

We, the File Manufacturers' Association of the United States, moved with sincere sorrow at the death of Wm. T. Nicholson, desire to express our grief and to declare our deep appreciation of the loss we have sustained in his death. We wish to bear witness to his singular uprightness, to his unimpeachable honor, to the sturdy manliness of his character.

With unswerving devotion to the development of the file business, with steadfast integrity and far seeing sagacity he made himself a power in the growing and expanding business which he had seen start from such small beginnings.

As representatives of an industry in which he was pre-eminently successful and to which he gave so much, we publicly testify our appreciation of his worth and our sorrow at his loss.

We dearly cherish his memory and sympathize with all those who, even more sadly than we, mourn his death.

The following preamble and resolutions relating to the Wilson bill and the proposed change in the duty on Files were also unanimously adopted:

Whereas, The proposed tariff bill, prepared by the Ways and Means Committee, so far as it relates to the change from specific to ad valorem duties, on which the cost of goods is not to be estimated at American valuation, but upon inventory prices in foreign countries; and

Whereas, We know from past experience this change opens the door to fraud through disguised, fictitious and undervalued invoices, and will largely discriminate against the honest American importer; and

Whereas, Many changes in the present duties are proposed, which examination shows must disastrously affect many of our manufacturing industries, resulting also in diminished trade;

Therefore be it Resolved, That the File Manufacturers' Association of the United States record this emphatic protest against the passage of the Wilson bill, as legislation that will retard our industrial progress, jeopardize several millions of invested capital and reduce the earnings of thousands of skilled labor of special value to the File industry, but owing to the special nature of the business thoroughly unfitted for any other class of mechanics if deprived of the present means of support.

Banquet to Employees.

RUKA BROS. MFG. COMPANY, Boscobel, Wis., gave their annual banquet to employees on the night of January 1. Forty-five covers were laid. At the head of the table sat the president of the company, John Ruka. Several addresses were made by those present, including John J. Ruka, who stated that while the past year had been a gloomy one in manufacturing circles the company had no

cause for complaint, 1893 having been a satisfactory year with them. The dinner was very much enjoyed by all who participated in it and materially contributed to the good feeling which has prevailed between the company and their employees.

Russell & Erwin Mfg. Co.'s New Catalogue.

RUSSELL & ERWIN MFG. COMPANY, 43-47 Chambers street, New York, and New Britain, Conn., are about distributing an illustrated descriptive catalogue and price-list, which is designated as Volume VIII. In compiling this mass of material it has been their careful endeavor, without at all impairing the efficiency of the work, to produce as compact a digest of the kinds, styles, finishes, &c., of the goods they manufacture and deal in as possible. With this in view they have discarded many patterns that have either been superseded by others of a similar character or become obsolete.

The book contains 926 pages, 11½ x 9¼ inches, and is substantially bound in red leather, with stiff board covers and cloth sides. At the front is a page engraving of the extensive works at New Britain. On the reverse of the title page is a reprint of a circular issued with their catalogue of 1853, to which reference is made as being equally pertinent now.

Following the circular is a page devoted to a list of their goods for which medals and diplomas of highest award were given at the World's Columbian Exposition, including Builders' Hardware, Screws and Bolts, House Furnishing Goods and Carpenters' Tools. Next in arrangement is the alphabetical index, following which is a page describing the character of finishes, with numbers by which they may be designated.

In the 150 pages at the beginning of the book assigned to Door Locks, for the purpose of economizing space, they have made the illustrations uniformly three-quarters size. To facilitate the selection of Locks and accompanying trimmings, as Knobs, Escutcheons, &c., a great variety of kinds and styles of furnishings have been arranged with the various Locks, each designated by separate numbers. This obviates largely the necessity of determining combinations by the buyer, at the same time giving a wide latitude in regard to design and cost. In connection with Locks will be found a page of illustrations on the bevel of Doors, which will assist in ordering Locks with special bevels. Much attention has also been given to master keying. Car Door Locks and Hardware are now in the main book, this department heretofore having been treated separately.

In a catalogue of this size, having a double column index of 18 pages, it is impracticable to particularize; but beginning with Builders' Hardware in almost endless variety, there will be

found the innumerable kinds of goods from specialties to staples usually found in Hardware stores, including large assortments of Mechanics' Tools, Padlocks, Screws, Bolts, Nails, Brads, &c.; House Furnishing Goods, Cabinet Hardware, Wrought Goods, Cutlery, Wire Goods, Agricultural Implements, Plated Ware, Ammunition, Sporting Goods, &c.

The catalogue shows the care and skill which have been given to its compilation and arrangement, with the result of making an exceedingly convenient, comprehensive and useful volume, which will be appreciated by the trade.

Job T. Pugh.

JOB T. PUGH of 3112-3120 Market street, Philadelphia, manufacturer of Augers, Bits and Chisels, will about February 1 remove his plant from his present location to a new building which he has erected at Thirty-first and Market streets. The business was established in 1774 in a small shop at the rear of the old Pugh homestead, long since demolished, situated near the site of the present factory, where it was carried on until 1818 by Mr. Pugh's great grandfather and a partner, under the firm name of Pugh & Brooke. In 1818 the business was taken over by his grandfather, Benjamin Pugh, and by him continued until 1857, when it passed into the hands of the father and uncle of the present proprietor, who, under the name of Pugh & Brother, carried it on until 1872, when the father became sole proprietor. In 1888 Mr. Pugh died and the business fell to Job T. Pugh, his son, who has increased it to an extent rendering larger quarters absolutely necessary. For 120 years, therefore, the name of the Pughs has been connected with the manufacture of Augers and Bits in this country. The new building is of brick, 70 x 70, and contains four stories and basement. It is admirably situated, adjoining on one side the Westchester section of the Pennsylvania Railroad. It is open all round, thus commanding an excellent light for manufacturing purposes. The basement will accommodate the engine and boiler and some of the heavier machinery.

The engine and boiler, each 80 horsepower, will be supplied by the Altoona Mfg. Company of Altoona, Pa. The first floor will contain most of the machinery, and the remaining floors will be devoted to packing room, office and stock rooms. An elevator has been put in by Morse, Williams & Co., and there are incased fire escapes on each floor, opening from the iron balconies. The sanitary arrangements are perfect, each floor being supplied with lavatories embodying the latest ideas in substantial plumbing. The building is lighted with gas throughout, and heated by steam. The machinery plant has been considerably augmented by the addition of new and improved machinery, and manufacturing facilities are thereby increased. Mr. Pugh expects to develop his home and export trade to quite an extent. He is already making regular shipments to South America, Mexico, Cuba and Canada. Besides pushing his Black Finish Augers and Bits, so well known to the Hardware and car building trade, he will pay special attention to his line of improved hollow Mortising Chisels for boring square holes. He claims for these Chisels that they will not choke, and states that they are made with a ball shaped bore which allows the bit to revolve with the minimum amount of friction.

**Western Retail Implement
and Vehicle Dealers' As-
sociation.**

THE Western Retail Implement and Vehicle Dealers' Association held their annual meeting at Kansas City, Mo., on January 16, 17 and 18. The members of the association are principally residents of Kansas and Missouri, but among them are a number of business men from adjoining States. The officers for last year were as follows: J. N. Cunningham of Norbourne, Mo., president; E. R. Moses of Great Bend, Kan., vice-president; H. J. Hodge of Abilene, Kan., secretary and treasurer. There was a large attendance at the meeting, and many important subjects were discussed, among them being the equalization of freight rates, the appointment of conflicting agencies by manufacturers, credits, chattel mortgage laws, reclamation of Western arid lands, &c. The by-laws were amended so as to make any person or firm in the retail implement, vehicle, Hardware or stove trade eligible to membership. The following officers were elected for the ensuing year: E. R. Moses of Great Bend, Kan., president; J. B. Robinson of Nevada, Mo., vice-president; H. J. Hodge of Abilene, Kan., re-elected secretary and treasurer. A gold headed umbrella was presented the secretary in behalf of the association. The following standing committees were appointed: Transportation, H. C. Taylor, J. H. Churchill, S. W. S. Childs, J. D. Maguire and A. B. Hutchinson; Chattel Mortgage, J. D. Clarkson, S. Topping and C. J. Smith; Commission Contracts, S. Topping, T. J. O'Neill, J. D. Clarkson, D. Badger and J. D. Maguire; Drayage, R. S. McCrary, J. N. Cunningham and Ed. Heeney; Weighing, G. H. Barker, A. B. Hutchinson and J. R. Van Zandt; Classification, J. D. Clarkson, C. A. Hodge, J. T. Prendergast, Frank Scruby and W. S. Crouch; Express, W. S. Coleman, Jesse Childs, J. H. Hill and G. E. Riner; Grievance, C. C. Curtis, A. Graff and Henry Noble.

The following Board of Directors was chosen: C. C. Curtis, John Lyons, J. N. Cunningham and H. J. Retzel.

The Relative Merits of Cut and Wire Nails.

AN INTERESTING DESCRIPTION of an extended series of experiments made by F. W. Clay to determine the holding power of Nails is given in a recent issue of *Engineering News*. Accompanying the article are tables, diagrams and cuts illustrating in a forcible manner the tests which were applied to the different sizes and kinds of Nails under various conditions. The conclusions arrived at are in some particulars so different from prevalent ideas regarding the most desirable form for Nails, also of the relative value of Cut and Wire Nails for effective use, as to excite the interest of the manufacturer, retailer and contractor. The following conclusions have been selected from those given in the article referred to as of the greatest interest to our readers :

Cut Nails are superior to Wire Nails
in all positions.

The main advantage of a Wire Nail is in its possessing a sharp point.

If Cut Nails were pointed their efficiency in direct tension would be

increased by about 30 per cent. ; Wire Nails without points have but half of their ordinary holding power.

The tenacity, of Wire Nails at least, decreases with time, but not so fast, probably, when exposed to the weather.

The Nail's surface should be very slightly rough, though not granular; should not be galvanized or otherwise made smooth; and should not be barbed; and especially the barbs should not be sharp and angular. Barbing decreases the efficiency of Cut Nails about 32 per cent.

Nails should be wedge shaped in both directions where there are not special dangers of splitting.

The holding power decreases with time.

Nails are always strongest when driven perpendicular to the surface of the timber.

When subject to impact, Nails hold less than one-twelfth the strain they can stand when weight is gradually applied.

Record of Profits and Commissions.

BY VIATOR.

THE importance of keeping a correct record of the profits in a well regulated business is conceded. Every business man ought to know the result of his daily transactions.

Many concerns employ salesmen either on a stipulated commission or on a profit basis, or both. On the profit basis salesmen usually receive the difference between a fixed price agreed upon and the price they obtain for goods. These earnings are sometimes settled weekly and at times monthly.

There are many ways of keeping these accounts, but simplicity and correctness are the principal factors of such a record. Each of the following headings may be suggested.

1. Name of customer.
2. Address of customer.
3. Date of order or invoice.
4. Number of order.
5. Folio of sales book.
6. Cost of goods.
7. Amount of invoice.
8. Value of goods charged to salesman.
9. Credit of salesman, consisting of the difference between headings 7 and 8.
10. Commission of salesman.
11. Profit of sales to which salesmen are not entitled.
2. Firm's profit, consisting of the difference between headings 8 and 6.

This method is illustrated in the accompanying diagram recording representative transactions with several customers and salesman.

Such a record also enables a firm to estimate the value of stock on hand.

Assuming stock on hand January 1 was valued at	\$30,350.23
Purchases during January.....	10,352.19
	<hr/>
Cost of goods sold during January.....	\$40,687.42
	<hr/>
Value of stock February 1.....	12,915.95
	<hr/>
Value of stock February 1.....	\$27,771.47

Name	City	Date of order	No. of order	Folio	Cost	Amount of Invoice	Salesman Jones		Salesman Smith		Salesman Brown		Salesman Day		Salesman's 10% Commission	Firm's net profit.
							his Cost	his profit	his cost	his profit	his Cost	his profit	his Cost	his profit		
John Doe	Boston	July 1	100	300	560.00	620.00	590.00	30.00								30.00
Eddy & Co. Inc.	Chicago	1	101	301	726.90	154.00			135.00	19.00						8.10
Courland & Co.	Portland	2	102	302	623.00	739.00					690.00	49.00				67.00
Mey. & Son	Albany	2	103	303	1160.00	154.00							1260.00	28.00		100.00
Peckin & Hill	Tray	3	104	304	690.00	760.33					725.00	35.00				35.00
Smith & Lyon	Kane	4	105	305	550.00	700.00									70.00	80.00
Donald & Han	Lexing	5	106	306	430.00	500.00			460.00	40.00						30.00

Records of Profits and Commissions.

Band Saws.

WE ARE INDEBTED to Henry Disston & Sons, Philadelphia, for the following information with reference to the use of Band Saws, which we take especial pleasure in laying before our readers, as we are confident it contains many valuable suggestions which cannot fail to be of service to those interested in Band Saws:

We receive many letters from band mill owners and operators asking our advice as to the best manner to fit, tension and operate the Saws to attain the best results in capacity and quality of the lumber made, and at the same time get the most wear out of the Saws. It is impossible to lay down a set of rules to fit all cases, or answer correctly any single one without knowing all the conditions under which the Saws are run, but we will give a few of the most important points in reference to the care and management of the Band Saw, which, if followed out carefully, cannot be otherwise than of a benefit to those who have neglected any of these points.

We will assume that you have a good modern mill, one from a first class builder who has learned from experience to so proportion and distribute the metal in his machine that the Saw can be strained up to the proper point without springing or distorting any part of the machine and have an ample margin of strength to properly stand the additional strain put on it by vibration. (Such a mill is the only one a man can reasonably expect to get highest results from.)

Then, with this mill well put up, solidly anchored and in perfect alignment, the capacity is only a question of skill and expertness of the operators.

None of the leading band mill builders are making as much crown to their wheels as they were a few years back, and some of them are making flat wheels. Each style has its advocates and will give good results when properly handled; but all of our experiments are in favor of flat wheels, both as to capacity of mill and life of Saws, though as some of the best mill builders give $\frac{1}{4}$ inch crown in a 10-inch face wheel, it seems a question of education or preference with the operators. Still, common philosophy shows that the least amount of crown one has in their wheels the less tension necessary in the Saws, which, in turn, means less hammering; and rolling flatter Saws, less kerf and less tendency to crack.

Perfectly uniform tension is the next important point, for if a Saw has fast and loose spots in it the tendency to crack is largely increased, the fast light spot cracking from undue tensile strain and the loose spot from constant buckling of surplus metal. The swaging and fitting of the teeth is practically the same as in a full swaged gang Saw, the swaging being side filed to a uniform width, with an under cut in order to leave the extreme point of tooth a trifle the widest. The full amount of swage when side filed should never exceed No. 8 gauge in a 14 gauge Saw, and in hard timber can be run on No. 9 gauge. It is advisable to run with as little swage as practicable, as it decreases tensile strain on the Saw. The amount of hook is governed by the timber to be sawed and varies from $4\frac{1}{2}$ inches in 10 inches to $6\frac{1}{2}$ inches. A medium between the two ($5\frac{1}{2}$) is the most popular and seems to give most generally good results. A good round gullet is always advisable, as it gives best circulating room and equalizes bend of blade in passing over the wheels.

Never let the Saw come in contact with the back guard wheel, as case hard-

ening is bound to ensue, from which cracks will surely result. In case the Saw is accidentally forced against the guard and case hardened, remove the glaze at once by holding a piece of soft emery wheel against the back edge while the Saw is running slowly.

It is essential to have the toothed edge of the Saw tighter than any other part, and to accomplish this without materially affecting the uniformity of tension, roll the Saw a little longer on the back edge. Let the increased length begin at the point in the Saw where greatest tension shows, and let the back edge show about $\frac{1}{8}$ inch rounding in every 5 feet; then tilt the upper wheel forward enough to make the Saw have as strong a pressure on the wheel at back edge as at front; this will leave that part of the Saw between the wheels with a tight toothed edge without subjecting it to that undue strain brought about by making the tooth edge tightest by an all tilt movement. The guides should be lined with either soft Bab-bitt metal or hard end wood and adjusted as closely to the side of the Saw as possible without heating the blade by friction against the metal or wood. The side of the Saw must be in perfect alignment, with the back and guides adjusted to saw; under no circumstances should the Saw be deflected by guides, but have free but small and equal clearance on both sides. The tensile strain should be only sufficient to prevent slipping of the Saw on the lower wheel. The highest capacity and best mills now rarely exceed a strain of 5000 pounds, which is all sufficient if Saw and mill are in proper condition, while no amount of strain will make an irregularly tensioned Saw or a poorly aligned mill make good lumber, but will instead bring more strain on every part of the mill and cause the Saw to crack much sooner.

Hand Book of Mexico.

PHILLIP G. ROEDER, 664 Cedar Avenue, Cleveland, Ohio, and Calle de La Palma No. 2, Mexico City, Mexico, has published a "Hand Book of Mexico," for the use of manufacturers and exporters in the United States. The compiler refers to it as containing names of reliable dealers in Hardware, agricultural and mining machinery, manufacturers needing machinery, merchants handling furniture, glassware, notions, dry goods, &c., together with the names of banks and bankers, landed proprietors and planters who consume largely, professional men, and exporters of Mexican products. The data, which has been supplemented and revised, represents largely an accumulation of names by him as manufacturers' agent from this country during a term of years. He offers it as a book of reference, and to facilitate the mailing of catalogues, circulars, commercial literature, &c. The book has 65 pages, 7 x $3\frac{1}{2}$ inches in size. The lists cover 43 of the leading cities, with the name of the State in which each is located, how reached, population, route of direct mail, names of railroads entering the place and notes on credits. Explanation is given of common Spanish abbreviations translated into English, as well as valuable general shipping directions, which merchants here will profit by if heeded.

Wilmot & Hobbs Mfg. Company.

WILMOT & HOBBS MFG. COMPANY of Bridgeport, Conn., and 20 Murray street, New York, have recently had their Copperized Swedoh Steel Oilers specified for naval uses by the United States Government and have executed the order

both for regular Oilers and engineers' sets. The company have since January 1 put in sufficient dynamo power to triple their capacity on these Oilers. It will be remembered that the Oilers are produced from Swedoh steel and are electro copper plated both inside and out to prevent rust, which heretofore has been a difficulty with steel Oilers. The company refer to the demand for this make of Oiler as having compelled them to increase their facilities.

Exports.

THE FOLLOWING are the total exports from the port of New York of the lines of goods named, shipped in seagoing vessels to all countries, for the six months ending December 31, 1893:

Mowers and reapers.....	\$1,275,201
Plows and cultivators.....	164,077
All other agricultural implements and parts.....	484,209
Brass and brass goods.....	260,623
Clocks.....	355,490
Copper ore.....	14,246 tons
Copper ingots, bars and old.....	1,437,996
85,854,596 pounds	8,636,986
Copper goods.....	85,396
Gunpowder.....	102,829 pounds
Other explosives.....	143,780
Pig iron.....	147 tons
Band, hoop and scrap iron.....	2,279
60,762 pounds	1,257
Bar iron.....	1,807,604 pounds
Car wheels.....	No. 3585
Castings.....	30,676
Cutlery.....	69,491
Firearms.....	71,932
Ingot, bars and rods of steel.....	249,580
73,986 pounds	2,913
Builders' Hardware.....	919,278
Machinery.....	4,038,863
Cut nails and spikes.....	
5,447,669 pounds	108,098
Wire nails, horse nails, tacks, &c.	
1,351,754 pounds	75,835
Iron plates and sheets.....	
1,534,097 pounds	30,381
Steel plates and sheets.....	
530,331 pounds	13,320
Steel rails.....	6,023 tons
Saws and tools.....	826,119
Scales and balances.....	161,272
Steam locomotive engines, No. 76	606,305
Steamstationary engines, No. 190	174,485
Steam boilers and parts of engines	281,487
Stoves, &c.....	83,538
Wire.....	12,596,994 pounds
Iron and steel, all other manufactures.....	1,134,617
Lamps.....	271,202
Lead and manufactures.....	31,114
Plated ware.....	130,705
Tinware.....	68,824
Wooden ware.....	129,788
Zinc pigs, bars, plates and sheets	
3,150,110 pounds	157,459
Zinc, all other manufactures.....	4,676
Total.....	\$23,066,423

Eagle Lock Co's Catalogue

THE EAGLE LOCK COMPANY, Terryville, Conn., and 98 Chambers street, New York, issue a catalogue, designated as volume 15, containing 445 pages, devoted to Cabinet, Trunk and Pad Locks. Combination, Chest, Drawer and Wardrobe Locks have recently been added to their line; also several new and desirable styles of flat key Chest, Desk, Wardrobe and Drawer Locks. Reference is also made to the new patterns of Padlocks as having met with favor. A full page view is given of their factories at Terryville, which is followed by an alphabetical index. Succeeding these are indexes and price-lists of Cabinet, Trunk, Sample Case, Buckle, Bag and Pad Locks, Lock Guards, Hasp Locks, Escutcheons, Toilet Hinges, Door Pulls and Catches, Casket Hardware, Cover Catches, Shelf Pins, Keys and Blanks, Master Key Work and a comparative list of Machine Locks. The foregoing goods are illustrated in great variety, with brass parts and flat Steel Keys in colors. The catalogue is handsomely bound, well arranged, and is accompanied by a discount sheet.

Cashing Checks.

MANUFACTURERS and jobbers who give checks and drafts to their traveling men for expenses, writes an interior merchant, often place the wholesaler or retailer upon whom they call in an embarrassing place. To refuse to cash these checks seems very churlish or suspicious, yet men who put faith in them are frequently made to pay dearly for this. Often times the traveling man is making his first trip. He asks you to cash a check of Smith & Jones, payable to the order of Wm. Brown. You are compelled to take his word for it that he is the Wm. Brown, and if he is not you must stand the loss. You dislike to refuse his request; at the same time you know that there is some risk connected with cashing the check, and whatever decision you come to you are sorry for. The trade ought not to be placed in this quandary. Notice could be sent to special points direct from the house, and copy of the signature of the agent given. The house so written to could then pay the check with confidence.

A Large Hardware Contract.

A LARGE CONTRACT for Builders' Hardware, perhaps the largest ever placed in St. Louis, has just been secured by the Heckel Hardware Company of that city. The contract was placed by the owners of the new Planters' House, a ten-story hotel being erected on the site of the famous Planters' House, which stood for many years on South Fourth street. Bids were advertised for, and the following houses responded: Simmons Hardware Company, A. F. Shapleigh Hardware Company, the Chicago Hardware Company, and the Heckel Hardware Company with P. & F. Corbin's goods, which finally proved to be the choice of the committee.

The bids submitted were remarkably close, and it took some little time for the committee to make its decision. The total amount of the contract is \$10,650 and as above stated it is probably the largest contract of the kind ever placed in St. Louis.

The Escutcheons and Door Knobs will be of special design, made from plans by Isaac Taylor, the well-known St. Louis architect. The first and second floors will be finished in silver, while the other eight floors will be solid bronze, copper finished. An innovation will be made in the kind of Locks used on the corridor doors. No two Locks will be alike. Each floor will be controlled by a pass key, with a different key for each floor, the whole being controlled by what is known as a grand master key, which will lock and unlock any room in the house. It will also be impossible for a guest to be locked in any of the rooms, and at the same time absolute security is afforded. Each corridor door will have a Corbin Door Check, which will control the door when shutting, preventing the possibility of the door slamming. To estimate the amount of Hardware required in this contract it is only necessary to take into consideration that there are 2000 door openings and over 1200 windows. The front entrance doors will be marvels in the way of decorative art metal work. The Heckel Hardware Company are vigorously pushing P. & F.

Corbin's goods, having recently secured the Mercantile Club contract, also that of the new high school, both of which are located in St. Louis and which called for large quantities of high grade Hardware. They are to be congratulated upon their latest success.

Bicycles for 1894.

SEVENTH ARTICLE.

SMITH WHEEL MFG. COMPANY, 42-50 West Sixty-seventh street, New York, and 921 H street, N. W., Washington, D. C., have the following Dart machines on the market for the coming season. Model A, Hustler, weighing 21 to 29 pounds, listing \$150; Model E, featherweight ladies', weighing 22 to 29 pounds, listing \$150; Model G, ladies' wheel for heavy riders, double tube frame, weighing 29 pounds, listing \$150; Model B, men's standard roadster, weighing 30 to 34 pounds, listing \$125, and Model C, ladies' standard roadster, weighing 30 to 34 pounds, listing \$125. The Model B and C machines have steel rims; all others have either wood or steel rims.

W. H. WILHELM & Co., Reading, Pa., have abandoned the manufacture of boys' and ladies' wheels, and will make men's only for 1894. Their line of Reading safeties includes the following machines: Reading road racer, weighing 28 pounds, listing \$100; Reading light roadster, weighing 30 pounds, listing \$100, and Reading roadster, weighing 35 pounds, listing \$90. The machines all have regular braced diamond frames, and all but the roadster have wooden rims. The wheels are fitted with Morgan & Wright tires, with option on Rex tire. G. & J. tires will be furnished at an additional charge.

KENWOOD MFG. COMPANY, Kenwood, Chicago, are making three heights of Kenwood bicycles for 1894. The No. 5 road racer is for general all around purposes, listing \$125. The No. 6, for tall men, is made lighter and equally durable, listing \$135. The No. 7, for very tall men, is fitted with either 6½ or 7 inch cranks, as ordered, listing \$150. A path racer is built especially to order, light and durable, for track purposes only, listing \$160. These road racers are constructed with double truss tubes, diamond frame, made of highest grade of weldless end tubing and drop forgings. The length of the seat post is such as to place the saddle for the rider in an easy position for fast riding. The wheels are fitted with improved Kenwood pneumatic tires, and geared 60 to 68. A ladies' wheel is also made, known as the Kenwood ladies' special, with U-frame, reinforced at the bottom of the U to give strength and light weight to the frame. The handle bars in shape are furnished to suit the rider, with vulcanite grips.

HICKORY WHEEL COMPANY, South Framingham, Mass., are offering Hickory Bicycles in the following models: Model E, weighing 33 pounds, stripped 30 pounds, listing regular finish, \$120; full nickel and natural wood, \$125; Model F, ladies' wheel, weighing 34 pounds, listing the same as Model E; Model G, weighing 31 pounds, listing \$120, and for full nickel \$125; Model H, weighing 33 pounds, listing \$110, and for full nickel \$115. All wheels are of natural wood, the rims made of one piece of selected white ash. The size of the wheels will remain the same—28 inches in diameter. The manufacturers remark that by careful experimenting they have demonstrated to their entire satisfaction that 12 spokes are sufficient for each wheel, and state that the spokes will be slightly reduced in size and altered in shape, resulting

in a much handsomer wheel than heretofore. The spokes are fitted to the rim this season by a new patented appliance, by means of which the entire rim and tire can be removed from the wheel, thus rendering the replacing of a spoke in case of accident a very easy matter. Other special features include chain adjustment, brake adjustments, mud guards, &c.

OVERMAN WHEEL COMPANY, Chicopee Falls, Mass., have a line of Victor wheels, including the following: Model D, weighing 33 pounds, listing \$125; Model D, high frame for unusually tall riders, listing \$125; Victor Flyer, standard frame, listing \$125; Victor Flyer, high frame, listing \$125; Victor Racer, weighing 19 pounds, listing \$150, and Victoria, ladies' wheel, listing \$125. The wheels are fitted with Victor pneumatic tires, steel or wood rims, with frames of Mannesmann spiral drawn weldless steel tubing, Victor saddles and chains of alternating crucible steel and aluminum links. The hubs have direct tangent nipple and butt end spokes, and the cranks are of forged crucible steel fitted on a taper, detachable with a wrench. The ladies' machine has a tilting saddle and mud guards of thin sheet rubber.

ELASTIC TIP COMPANY, Boston, Mass., include in their Bicycle catalogue Rubber Goods and Bicycle Sundries. The catalogue illustrates, with prices, pneumatic tires, cushion tires, valves, pedal rubbers, grips and handles, cement, repairing outfits, oils, enamels, frames, lamps, pedals, handle bars, guards, ball heads, frame lugs, ball head fittings, sprocket wheels, hangers, hubs and axles, rims, tool bags, bolts, pins and nuts, steel balls, chain adjuster, coasters and drop forgings.

Bigelow & Dowse Company.

THE FIRM of Bigelow & Dowse, Boston, have been dissolved by limitation, and they have disposed of all their stock and the good will of their business to Bigelow & Dowse Company, a corporation organized under the laws of Massachusetts. The new company will take all the assets and assume all the liabilities of the old firm, and will pay all bills and collect all accounts. This change will not involve any alteration in the management, which will continue the same as heretofore. The house is now in its fifty-fifth year, having been established in 1839.

Canadian Hardwaremen in a Hockey Match.

A VERY successful hockey match was played at the Beaver Rink, Montreal, on Saturday afternoon, January 27, between the teams of Caverhill, Learmont & Co. (the champions) and Frothingham & Workman. The weather was all that could be desired, being clear and cold, with the mercury about zero. Both teams, when they came on the ice, were in splendid trim. The firms, with their staffs, turned out in full force and enthusiastically cheered the contestants. Both teams played brilliantly, the match lasting about one hour and a half. The champions won the match by the score of two games to nothing. Caverhill, Learmont & Co.'s team have held the hockey championship of the Canadian Hardware trade for the last few years.

Trade Items.

IN THEIR ADVERTISEMENT in this issue Sickels, Sweet & Lyon, 35 Barclay street, New York, call attention to the fact that they are selling the Withington & Cooley Farming Tools, either from stock or from factory. They also continue the agency for the Cortland Door and Window Screens. Reference is also made to the fact that they are agents for the Union Steel Screw Company, the Eagle File Company and the Perfection and New Era Lawn Mowers.

AS APPEARS by the Special Notice on another page, E. Bissell, Son & Co., 12 Murray street and 15 Park place, New York, will, on Tuesday and Wednesday, February 6 and 7, conduct a special and peremptory sale of Gray Enamelled Opal Ware and Blue and White Ware, by order of the Lalance & Grosjean Mfg. Company. A line of first quality Agate Ware, discarded numbers, will also be disposed of, as well as a large line of stamped Tinned Ware, Blue and White and Opal Ware.

THE LITTLE GIANT TRUCK COMPANY's works at Syracuse, N. Y., have been secured by the G. L. Van Namee Mfg. Company, also of Syracuse, who will continue to manufacture the Little Giant Steel Trucks and other Hardware specialties. The Syracuse Door Hanger Company are the general sales agents for the Trucks.

THE TRADE will observe the effective advertisement of the Standard Axe & Tool Works, Ridgway, Pa., in which they call attention to the line of Axes they are putting on the market and their quality and finish.

WRIGHTSVILLE HARDWARE COMPANY, Wrightsville, Pa., have recently purchased from the Shepard Hardware Company, Buffalo, N. Y., as much of their business as relates to Blind Hinges, Shutter Hinges, Gate Hinges, Latches and Frame Pulleys, including patents, patterns, trade-marks, &c. They advise the trade in a circular letter that the high standard of the goods will be maintained in every particular.

AS RELATING TO GOODS which will have a prominent place in Hardware stores during the coming season, the advertisement of F. A. Herrick & Co., Jackson, Mich., in which they illustrate their Rack for Steel Goods, Shovels, Rakes, &c., will be of interest. Reference is made to different sizes of these Racks and their advantages.

THE CONNECTIONS heretofore existing between the Central Stamping Company of this city, on the one side, and the Lalance & Grosjean Mfg. Company, New York, and the St. Louis Stamping Company, St. Louis, on the other, have been severed, the two latter concerns retaining no interest, direct or indirect, in the first named. The severance has been of an entirely amicable character, and solely for the business interests of each concern. The only effect of the change will be that the Tinware heretofore manufactured and sold by the two concerns for the account of the Central Stamping Company will now be furnished directly by the Lalance & Grosjean Mfg. Company and the St. Louis Stamping Company, respectively.

THE ATTENTION of the trade is directed to the advertisement in this issue of the Superior Steel Company, Pittsburgh, Pa., with works at Mansfield, Pa. Announcement is made that the above firm are prepared to furnish hot rolled Strip Steel of any exact width up to 10 inches from No. 20 wire gauge to 2 inches thick; also, cold rolled Strip Steel from 10 inches to $\frac{1}{4}$ inch wide, of exact thicknesses, from $\frac{3}{16}$ to 0.005 inch. The different

kinds of Steel in which the above can be furnished are also given, and the further announcement is made that Ely & Williams, 38 Park row, New York City and 1239 Market street, Philadelphia, Pa., are the Eastern representatives of the firm.

THIRTY-FIVE CARLOADS OF NAILS were dispatched to St. Louis from the Carnegie mills, Beaver Falls, Pa., the other day, probably the largest shipment of its kind ever filled by a manufacturer.

VAN VORHIS Y. SANFORD, Monterey, Mexico, importer, issues a blank vest pocket memorandum book, with calendar and business advertisement in Spanish. A specialty is made of mining machinery.

IN THEIR ADVERTISEMENT THIS WEEK, Shoenberger & Co., Juniata Iron & Steel Works, Pittsburgh, Pa., direct the attention of the trade to their Juniata Hind Roadster Steel Horse shoes. The makers state that these Shoes are equally good under every condition of climate, winter or summer, for every day wear, and for either city or country use. For winter use they are stated to be particularly valuable, as the peculiar conformation of the Shoe, with its concave ground surface, entirely prevents "balling" or the loosening or pulling off of the Shoe by the suction of mud or clay, and also obviates a danger of laming the animal by picking up and holding stone, and will positively prevent gravel or any hard substance coming between the hoof and the Shoe. These Shoes are made lighter than the lightest of the Extra Swaged Horseshoes, and there are therefore a greater number to the keg, and are consequently cheaper to the consumer than the ordinary shaped Shoe, and at the same time possess better wearing and lasting qualities. The above firm make all sizes of these Shoes from No. 0 to 7, front and hind.

THE STATEMENT has been made in the course of the tariff debate that we have just begun to export Wire Nails to England. This is, however, only apparently the case. Late last year the president of one of the large Wire Nail and Barb Wire concerns in the United States went to London and sold a large line of Wire Nails and Barb Wire. We understand that this material was not really intended for the English market, but is to go to Australia. A part of it is shipped to the Antipodes via England, because the freights figure lower on the particular consignment, while a part is shipped direct.

Lockwood Mfg. Company's Catalogue.

THE LOCKWOOD MFG. COMPANY, South Norwalk, Conn., C. F. Guyon Company, New York, sales agents for the Middle and Southern States, have just issued a catalogue of over 600 pages, 10 $\frac{1}{2}$ x 14 inches in size. This is the first complete catalogue issued by the Lockwood Company since their purchase of the patterns, &c., from the Nashua Lock Company. Credit is due to Henry Hopkins, in whose hands the construction of the catalogue was placed, and who has charge of the catalogue department of the C. F. Guyon Company.

A table of comparative finishes occupies a full page, and by the aid of the table the leading finishes are so compared as to facilitate the substitution of the goods of the company for those of other manufacturers when desired.

A simple method is adopted of showing what constitutes the difference between the various Locks shown on any page, made with the same cases, but differing in front, tumblers, keys, &c.

This information is contained in tabulated form, given under the following headings: Number, Size, Front, Strike, Bolts, Tumblers, Changes and Finishes. On each page where finishes are mentioned, reference is made to page 1, where descriptions and prices of finishes are given.

Nearly a hundred pages are devoted to illustrating special sets of Inside, Front Door Locks and Vestibule Latches to match. These are all shown complete upon their respective pages, including Lock, Knobs, Escutcheons, Main Key and both Night Keys. This arrangement allows a dealer to tell his customer that everything shown on a particular page can be had for the price named. Special numbers are given to all sets of Locks, and at the bottom of each page of sets instructions are given to use only the special number in ordering, also the number of finish wanted.

A new and original system of numbering sets, which has been adopted for the convenience of the dealer, has been followed: Inside door sets have numbers in groups from 1 to 599, special sets being included in the first 100. The sets with jet and porcelain knobs are in the 200 line; bronze metal sets that are low priced in the 300 line, and fine sets in the 400 line. In the 500 line are grouped all those with three tumblers, many being duplicates of the one tumbler sets shown in the 400 group. In the front door and vestibule sets (which have the same number as the front door sets to match with the fraction $\frac{1}{2}$ added) all those with plain spindles are in the 600 group. The 700 line represents swivel spindle Locks having one tumbler on each bolt; the 800 line shows the same sets as to Locks and trim, but having three tumblers on the night bolt and one on the Lock bolt, while in the 900 group the same sets are again represented but with three tumblers on each bolt. The only change in the numbers of the respective sets is in the initial figure.

In numbering Shelf Hardware the system is followed of giving a different name to the same finish on bronzed iron when it is an ornamental pattern and when on a plain surface. This is done to avoid the confusion which might arise if both were known by the same name. All Shelf Hardware cuts are placed on the outer edge of each page, so that a casual running over of the pages will show the line of goods a dealer is looking for without the necessity of referring to the index. Instead of showing all the Sash Lifts, &c., of different designs on respective pages, articles of the same pattern are grouped on a page with analogous goods; so that in succeeding pages each page shows only one pattern. This is considered to be an improvement on the plan of devoting an entire division of a catalogue to one pattern exclusively.

From page 1 to 524 are contained all the goods manufactured by the Lockwood Mfg. Company, to which an index in the front of the book is devoted. The appendix pages from 525 to 608 cover the lines of goods of the many manufacturers for whom the C. F. Guyon Company are agents, and are included in a general index at the back of the book. In the general index the various divisions and classes of goods are indicated by the use of type of varying faces. The care and skill thus given to the compilation of this volume are evident, and the catalogue will be valued by the trade.

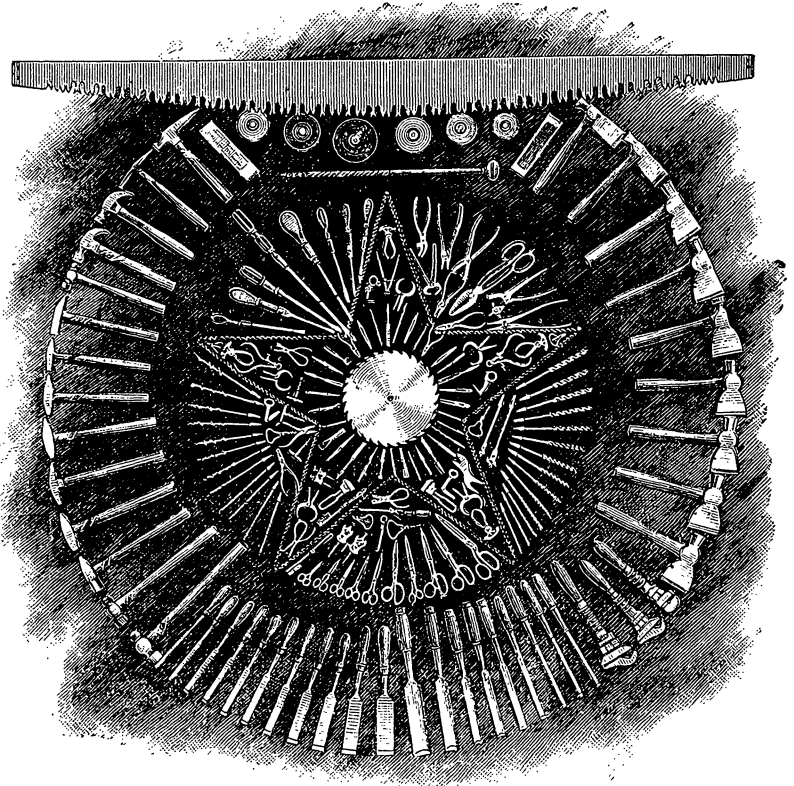
A Show Window Display of Tools.

THE accompanying cut represents a well designed and attractive arrangement of Tools, used by W. A. Guenther & Sons, Owensboro, Ky., as the center of a large window display in their Hardware establishment. The background upon which the Tools were fastened was black canton flannel covering boards. It will be noticed the goods shown are represented in entire lines, as Screw Drivers, Augers, Scissors, Chisels, Hammers, Hatchets, &c. This center piece was surrounded by Planes, Plumb and Levels, Hand Saws, Squares, Trowels, &c. The boards upon which the display was made measured 18 feet in length, 12 feet in height, and occupied L. E. Guenther and his assistant 2½ days in designing, selecting material and arranging the display.

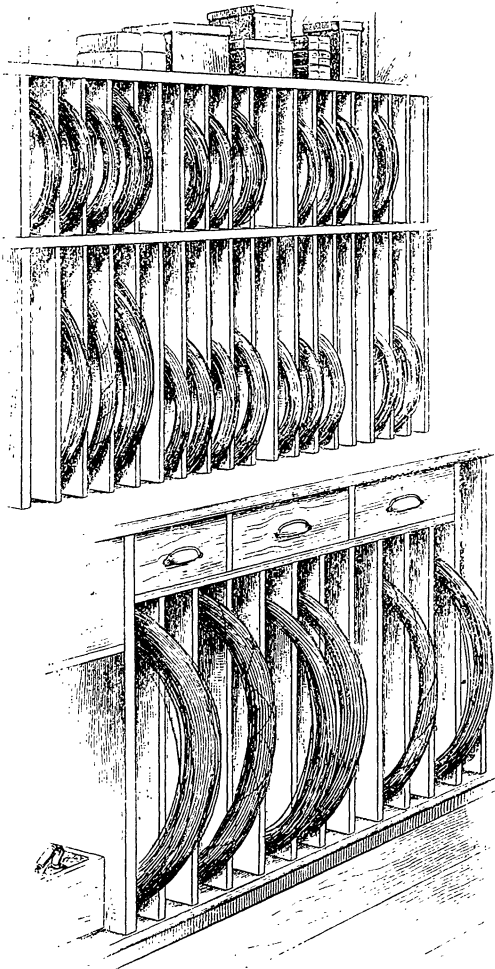
A Retail Wire Rack.

S. O. BURNETT, 288 Fulton street, Brooklyn, N. Y., has in use a convenient method of keeping Wire from which to retail. The accompanying cut represents a portion of a rack used for this purpose and located at the back end of the store, being a continuation of the shelving on one side. It consists of three sets of bins of various heights and widths,

designed to contain. On the top row there are 35 bins, each 12 inches high | Wire from 18 to 21 and brass Wire from 20 to 22 gauge.



A Show Window Display of Tools.



A Retail Wire Rack.

The second row from the top contains the same number of bins as the row above, of the same width, but 20 inches high. In these copper Wire is kept from 2 to 12 gauge and brass Wire from 1 to 19 gauge. The lower bins are each 4½ x 32 inches in size, except where the drawers reduce the height 5 inches. In these 23 bins tinned and coppered Wire is kept from 9 to 11 gauge, and black iron Wire from 1 to 16 gauge. The drawers are used for iron and copper Wire on spools, also for short remnants of Wire that have been cut from the coils.

Tardy Execution of Orders.

WE ARE IN RECEIPT from a well known manufacturing house of the following inquiry, to which we invite the attention of the trade:

We would like the opinion of those engaged in manufacturing on a point which causes us annoying correspondence at times. A customer orders goods which are entered for filling in regular order on books. Heavy demand and orders unfilled cause delay in filling. When order is reached and goods are shipped customer becomes abusive and claims the manufacturer had no right to ship goods without first notifying him. Our claim is that customer, if a good business man, keeps a copy of his orders, and if same are not filled in time to suit he should order same cancelled and not expect manufacturer to be responsible for his own negligence. Which is correct?

We shall be glad to have the opinions of merchants and manufacturers on this point.

and three drawers. All openings are marked on the partition boards with the size of the Wire each opening is and 3 inches wide, containing copper Wire from 16 to 23 gauge; annealed iron Wire from 18 to 24; tinned iron

Price-Lists, Circulars, &c.

CAMPBELL CUTLERY COMPANY, Syracuse, N. Y.: Campbell's practical Sliding Display Trays. The Trays are designed for brilliant display, convenient handling and prompt selling of all kinds of small goods in showcases. Illustrations show Pocket and Table Cutlery, Scissors, Corkscrews, Razors, &c., so arranged as to be fully displayed to the customer, and easy of access to the salesmen. The company were awarded the highest medal at the World's Fair for the superior merits of the Trays.

HOLLANDS MFG. COMPANY, Erie, Pa.: Vises, Machinists and Plumbers' Tools, Natural Gas Burners, &c. Illustrations show Exhaust Tumbling Barrels, Planer Chucks, Vises, Eagle, Stillson and Trimo Pipe Wrenches, Pipe Tongs, Roller Pipe Cutter, Pipe Stocks and Dies, Ratchet Screw Cutting Stocks, Plumbers' Malleable Iron Ladle, Hose Reel, Bench Anvil, Gas Burners, open and inclined Grate Burners, Gas Heating Stove, &c. In reference to their Vises, the manufacturers state that the castings are made from a mixture specially adapted to this class of work; steel jaws firmly welded and tempered, patterns scientifically proportioned for extra strength and durability as well as convenience in use, and having no complicated mechanism to get out of repair.

SILVER & Co., 304-310 Hewes street, Brooklyn, N. Y.: Household inventions. A neat catalogue and price-list of 48 pages illustrates Potato Mashers, Beef Tea Press, Self Basting Roaster and Bakers, Trade Display Stands, Coffee and Tea Pots, Coffee Urns, Beater and Dessert Maker, Egg Clock, Lamp Chimney Stove, Flour Bin and Sifter, Pyramid Steam Cooker, Cooking Crock, Egg Poachers, Glass Rolling Pin, Vegetable Press, Night Lamp, Lemon Juice Extractors, Hat, Coat and Towel Rack, Roach and Beetle Trap, Spiral Stoves, Oil Stoves, Gas Stoves, Gas Heaters, Trouser Stretcher, &c.

UNION MFG. & PLATING CO., Freeport, Ill.: Hardware and notion specialties. Illustrations, with prices, are given of Curling Irons, Electric Curlers, Curling Iron Heaters, Pinching Irons, Tracing Wheels, Pinking Irons, Broom Holder, Stove Pokers, Stove Lid Lifters, House Numbers, Timbale Irons, Savoy Shears, Ice Shaves, Ice Picks, Fish and Frog Spears, Drawer Pulls, Ornamental Brass Hinges, Ice Box and Cupboard Latches, Conroy Refrigerator Door Fastener, Shutter Sheaves, Arm and Foot Rail Brackets, Chicago Wagon Jack, Horse Tooth Files, Box or Hay Hooks, Butchers' Selecting Hooks, &c.

W. H. BRIGGS & SONS, Valdosta, Ga.: Turpentine Tools. An illustrated catalogue devoted especially to Hacks, shows Hacks, Pullers, Single and Double Edge Scrapers, Shove Downs, and Closed or Bird-Eye Hack. It is stated that the Hack blades are made from Jessop's best cast steel, with the best refined hand hammered iron for the shanks, the blades so tempered as to give the best results. The concern are agents for J. P. Williams & Co., Savannah, and the Downing Company, Brunswick, Ga.

HYGEIA FILTER COMPANY, Detroit, Mich.: Porous Tubular Filters, also sand Filters under the Bowden patents. Illustrations show tubular Filters in the following styles: Popular, Domestic, Club House, Excelsior, Perfection and Victor. The smallest Filter designed for house use has a capacity of 5 gallons per hour, while when large quantities of water are required Filters are arranged in batteries of two to

eight cylinders, with a capacity of 60 gallons per hour per tube, so that unlimited quantities of water can be filtered. An illustration shows one plan of connecting the Filters and compression accumulator to the water pipes of a house. The filtering tubes are made of natural stone, with walls from 1 to 1½ inches thick, each tube being inclosed in a separate jacket. All metal used in their construction is brass, except the frame supporting the Filters. The jackets are tinned inside and nicked outside. It is stated that the Filter tubes are secured in position by simple means and are easily removed if desired, but that they are never required to be removed for cleaning.

H. A. JOHNS & Co., 815 Jefferson street, Philadelphia: Catalogue of Elevators, Dumb Waiters, Hoists and Automatic Hatch Doors and Safety Gates. The catalogue contains many things of special interest to architects and builders.

THE GURNEY REFRIGERATOR COMPANY, Fond du Lac, Wis.: Catalogue of the Gurney Patent Refrigerators for 1894. This is a 48-page catalogue and price-list, handsomely printed and profusely illustrated, giving full descriptions of the Gurney line of Domestic Refrigerators, Grocers' Boxes, Refrigerator Sideboards, Ice Chests, Cooling Rooms, Water Coolers, &c. In a letter to the trade the company call attention to the decided change in the cabinet work of their goods for the coming season. While they feel that no apology is needed for the style and finish of their goods in the past, yet they take pleasure in the new dress which they present this year. They have again added to their factory capacity, and are now turning out 100 Refrigerators per day. They claim many points of merit for their system of construction, prominent among which is cleanliness. A removable galvanized ice compartment is used, which can easily be taken out and cleaned, while air circulation is secured through holes in its sides, thus obviating the use of flues. This is illustrated by sectional cuts, as well as other features in connection with drip pipes, construction of walls, locks, casters and hinges. Ash only is used for outside cases, while mineral wool has been adopted for filling on account of its high rank as a non-conductor.

PARLIN, ORENDORFF COMPANY, Canton, Ill.: Implements. A catalogue of 173 pages illustrates Plows, Sulky Lister, Drills, Wheel Plows, Gang Plows, Cultivators, Harrows, Stalk Cutters, Garden Plows, Double Shovels, Corn Planters, Hay Loader, Eveners, &c.

PAGE BELTING COMPANY, Concord, N. H.: Twenty-fifth anniversary souvenir of the company. The book is devoted to a history of the company at the Chicago Exposition, and contains 36 pages, with a large number of full page illustrations showing the exhibits of machinery upon which their Belt was used. A view is given of their works at Concord, also of their stores at Boston, New York, Chicago and San Francisco.

LALANCE & GROSJEAN MFG. COMPANY, 19 Cliff street, New York: Complete catalogue and discount sheet, dated January, 1894. The book consists of 432 pages, and is of handy size for the pocket—6½ x 5 inches—with a flexible cover of red cloth and red edges. Many new goods have been added and are now for the first time illustrated and priced, while on a number of specialties the list prices have been reduced. The additions to their lines have been so numerous that in order to keep the book down to

portable size whole departments have been condensed into one or two pages. As an illustration, their lately extended line of Crystal Steel Ware is confined to two pages. The same is true of their Blue and White, Blue and Blue and White Enamel Ware lines. The Crystal Steel Ware referred to is a grade of goods which have been manufactured by Lalance & Grosjean for some years, but confined to special lines. They have now extended it so as to cover all the lines comprehended in their well known Agate Iron Ware. Large additions have also been made to the Japanned and Pieced Tinware departments.

THE TOLEDO METAL WHEEL COMPANY, Toledo, Ohio: Steel Velocipedes, boys' Bicycles, Express Wagons, Wheelbarrows, Tricycles, Wire Wheels, &c. These goods are shown in a large variety of styles in an 1894 catalogue and price-list. The manufacturers direct particular attention to the following additions to their line: Ball bearing Children's Carriage Wheels with iron or rubber tires, c-plate or nickel plated, to fit standard axles (2¾ x 7-16); perfection ball bearing girls' Tricycles and miniature Ferris Wheels for advertising purposes.

SARGENT & Co., New Haven, Conn., and New York: Screen Door and Window Hardware for the season of 1894. It is stated that the pamphlet contains everything in Hardware necessary for making and putting together screen doors and window screens, for opening and closing them properly and for keeping them shut when desired. Illustrations and prices are given of Spring Hinges, Coil, Torrey and Rubber Door Springs, Window and Screen Door Brackets, Door Check, Screen Door Catches, Pulls, Sash Lifts, Gate Hooks and Eyes, &c.

LANSING WHEELBARROW COMPANY, Lansing, Mich.: Wheelbarrows, Warehouse Trucks, Hand Carts, &c. A catalogue of 80 pages illustrates, with prices, the Hoag Fence Machines, Field Rollers, Lawn and Hand Carts, Water or Barrel Carts, Push, Fruit and Bakers' Carts, Warehouse Trucks, Depot, Grocers' and Baggage Trucks, Runways, Stove Carrier Truck, Warehouse Baskets, Standard Barrel Trucks, Hods, Horse Poke, and an extended line of bolted, garden and miscellaneous Wheelbarrows.

THE NASON MFG. COMPANY, 71 Beekman street, New York, issue an illustrated book detailing in verse the deacon's experience with heating apparatus, and particularly with the Nason Equator Heater. The book is tastefully printed, and neatly bound in stiff cloth covers.

TOWER & LYON, 95 Chambers street, New York: Tower's police equipments. An illustrated price-list shows Handcuffs, Leg Irons, Police Belts, Clubs, Cuffs, Lanterns, Shields, Buttons, Caps, Rubber goods, Revolvers, Jail Locks and humane restraint implements.

BLOUNT MFG. COMPANY, Boston, Mass.: The Blount Door Check and Spring, also the Standard Door Stop. A pamphlet illustrates and describes these goods, paying particular attention to the Door Check and Spring. The manufacturers state that the Check and Spring is noiseless in action, free from packing friction and self lubricating.

T. H. CHUBB ROD COMPANY, Post Mills, Vt., send a folder, in which they announce that their 1893 catalogue is full and complete, and as it contains a full line of their Angling Goods, they will not issue a new one for 1894. Reference is also made to the quality and the completeness of

their line of Rods, Reels, Lines, Flies and Snelled Hooks.

S. W. CARD & Co., Mansfield, Mass.: Illustrated price-list of Taps and Dies. The line includes Machinists' Hand, Machine Nut, Pulley, Taper, Master's or Hob, Stay Bolt, Patch Bolt, Bit Brace, Stove Bolt and Machine Screw Taps; round solid, square solid and round adjustable Dies; also blacksmiths', machinists', gunsmiths' and amateurs' Screw Plates, Tap Wrenches, &c. The catalogue is handsomely illustrated and well arranged.

CHAS. FORSCHNER & SON, 41-43 Livingston street, New York: Scales, Spring Balances, Butchers' Tools and Machinery. An illustrated price-list of 96 pages shows a large line of Spring Balances, both straight and circular; Postal Scales, Family Scales, Counter and Meat Scales, Tubular Locomotive Balances, Lifting Machines, Platform Scales, Steelyards, Scale Beams, Butchers' Machinery, Lard Coolers, Smoke House, Lard Presses, Bean Cutter, &c. The manufacturers state that every Balance stamped with their name is warranted correct, and full guarantee of the same is always given.

ROMER & Co., Newark, N. J.: Padlocks, Jail Locks and Night Latches.

In a small catalogue just issued are illustrated leading features of their productions, shown in cuts of actual size. These include self-locking bronze Spring Padlocks, malleable iron Spring Padlocks, bronze waterproof tumbler Padlocks, bronze and tinned malleable Padlocks, iron and cast bronze Spring Padlocks, Jail Locks, Night Latches, &c. Particular attention is directed by the manufacturers to their No. 40 self-locking bronze Spring Padlocks, which will admit of 1920 changes, to be opened with master key; also to their No. 155 Jail Lock with undetachable shackle.

It Is Reported—

That Clement Hardy's Hardware store, at Richmond, Ind., was burglarized on the 19th ult. \$50 worth of goods were taken.

That the contract for supplying the implements for use in the parks of Denver, Col., has been awarded to the George Tritch Hardware Company of that city.

That the Hardware store of Nathan Kenyon, Ionia, Mich., was burned out on the 20th ult.

That Henry Wallis has purchased an interest in W. D. Parker's Hardware store, at Sampton, Iowa. The firm will hereafter be known as Parker & Wallis.

That the T. B. Rayl Company, Hardware merchants, have been incorporated at Detroit, Mich. The capital is \$60,000, of which \$42,000 has been paid in. The incorporators are Thomas B. Rayl, Dudley W. Smith, Alexander Paton and James Wilkie.

That Lamb & Folsom have purchased the Hardware stock of J. W. Cole & Son, Dryden, Mich.

That the Hardware store of A. M. Avery, Pensacola, Fla., was burglarized on the 14th ult. A number of Revolvers, Saws, &c., were carried away.

That burglars broke into the Hardware store of A. B. Rathbone, Oakfield, N. Y., on the 16th ult. and blew open the safe. They got about \$5 in small change. The Hardware stock was not disturbed.

That John Schoutag has bought the Hardware stock of Amos Lamb, South Royalton, Vt.

That a certificate of incorporation has been issued to the K. J. Hoge Company, Wheeling, W. Va. The concern will deal in Hardware, Implements, &c. A capital of \$30,000 is authorized. The incorporators are K. J. Hoge, G. M. Brown, William Rogers, L. J. Rogers and Arthur Rogers.

That Grier Bros.' Hardware store at Dubois, Pa., was destroyed by fire on the 11th ult.

That the Hardware store of John M. Chalfant, Kennett Square, Pa., was robbed on the 10th ult.

That Fred. S. Sterling has purchased the interest of his partner, H. C. Abell, in the Hardware and Tin business at Lowville, N. Y., and will hereafter conduct the store alone.

That the Hardware store formerly owned by Mason & Richardson, Cambridge, Iowa, has become the property of Willard & Co.

That E. Gordon, Hardware merchant, Sherwood, Mich., has nearly completed the erection of a new Hardware store.

That C. A. Tope and Wallace Beamer have bought the Hardware store of Tope Bros., Dell Roy, Ohio.

That M. F. Redmon has retired from the Hardware firm of Myer & Redmon, Osceola, Iowa, and has gone to Omaha, where he will be connected with the Avery Planter Company. Mr. Redmon's interest has been purchased by Ruby Myer, son of the senior partner, by whom the business was established in 1867.

That O. Gard has opened a new Hardware store at Fowler, Ind.

That M. Fishel has purchased the P. L. Barlow Hardware stock at Neosha, Mo., and has opened up for business at the old stand, with Mr. Barlow as manager.

That J. J. Rutka, who for many years was in charge of the Prusia Hardware Company's wholesale business, at Fort Dodge, Pa., is now engaged in the retail Hardware business at Grand Rapids, Mich.

That T. A. Murphy, Trenton, Mo., will re-enter the Hardware business about February 1. Mr. Murphy for the past two years has been Mayor of Trenton.

That the Hardware stores of H. Wilson and Nebo Hardware Company,

Prize Competition No. 28.

CLOSING FEBRUARY 17, 1894.

Subject: Bicycles in the Retail Hardware Store.

In this competition the sale of Bicycle accessories, such as Lamps, Bells, Tools, Tool Bags, Pumps, Lubricators, &c., is included in connection with Bicycles.

There is an evident tendency toward a largely increased sale of Bicycles through the Hardware trade, and this competition is announced for the purpose of obtaining suggestions as to the methods by which this line of business can most successfully be carried on by the retail Hardware merchant.

Those discussing the subject are free to treat it as they think best, but the following points are suggested as deserving attention:

- The feasibility and desirability of selling Bicycles and Bicycle Supplies in the retail Hardware store;
- The difficulties in the way and how they may be overcome;
- The extent of the assortment which the Hardwareman should carry;
- Whether he should confine himself to one line of Wheels;
- The best methods of stimulating the sale of these goods; and
- Whether it is necessary or desirable to have a repair department and how it may best be conducted.

The following prizes will be awarded:

First Prize,	-	-	-	\$25.00.
Second Prize,	-	-	-	15.00.
Third Prize,	-	-	-	10.00.

This subject is open to all.

In its discussion it is desirable that reference to particular manufacturers or machines be omitted.

We shall have the privilege of publishing any of the contributions received.

Contributions are to be received not later than February 17, 1894. They should be addressed as follows:

DAVID WILLIAMS,

96-102 Reade Street,

New York.

Prize Competition No. 28.

Roodhouse, Ill., were destroyed by fire on the 14th ult. The losses are almost covered by insurance.

That L. L. Smith has concluded to discontinue the Hardware part of his business at Princeton, Iowa, and has moved his entire stock of Shelf Hardware to Allerton, where his principal store is located. He will, however, continue to retail Implements at Princeton as heretofore.

That the Lobeck-Linn Hardware Company, Omaha, Neb., held their annual meeting on the 9th ult. and elected the following officers for the ensuing year: C. O. Lobeck, president; C. H. Linn, vice-president; E. A. Pollock, secretary and treasurer.

That the Hardware store of Doak & Wolfe, Grenada, Miss., was badly damaged by fire on the 13th ult.

That W. E. Platner, for many years in the Hardware business at Mount Vernon, Iowa, has disposed of his stock to Messrs. Powers & Chambers.

That H. N. Askam has purchased a one-fourth interest in the Hardware and Implement store of Brobst & Porter Bros., Findlay, Ohio.

That W. W. Marshall has disposed of his Hardware business at Red Oak, Iowa, to Maloney & Son.

That Geo. McVey, Waukegan, Ill., has moved his stock of Hardware into a new store.

That J. W. Dean will open a new Hardware store at Bellefontaine, Ohio, shortly.

That Wm. Braucht of Medford, Iowa, has purchased the Hardware store of J. H. Drake, at New Virginia, Iowa.

That Turney & Martin will soon open a Hardware store at Elma, Iowa.

That E. Bouchard, formerly a Hardwareman of De Soto, Iowa, has purchased the W. K. Gatchell Hardware stock at Des Moines, Iowa, Mr. Bouchard was formerly a resident of Des Moines.

That J. R. Weimer is making preparations to open a Hardware and furniture store at Hardy, Neb.

That J. B. Frazier has sold his Hardware store at Fairmont, Minn., to Schied & Son of Delavan.

That W. F. Brandon has bought the Hardware store of J. T. Emmons, Greenfield, Iowa.

That R. D. McKown has sold his Hardware business at Ludlow, Ill., and purchased an interest in a dry goods store at Atlanta.

That Lemuel C. Coffin of Rolfe, Iowa, has purchased a stock of Hardware at Lyons, Neb.

That Frank Brodhecker is preparing to open a Hardware store at Brownstown, Ind.

That Harm Brothers & Cornwell, Flanagan, Ill., have dissolved partnership in the Hardware business. The Messrs. Harms have purchased Mr. Cornwell's interest, and will continue the business under the style of Harms Brothers.

That C. V. Lockridge has purchased T. A. Hanson's interest in the Hardware firm of Lockridge & Hanson, and will continue the business at the old stand.

That John Whitelaw, Kidder, Kan., is intending to conduct a tin shop in connection with his Hardware store.

That the People's Hardware Company, Durango, Col., have been dissolved, J. S. Barber retiring. The business will be continued under the same name by Arthur L. Warren and E. D. Morgan. Mr. Barber has not yet

decided as to what his future course will be.

That G. E. Meyer & Son, South Bend, Ind., have materially increased the capacity and convenience of their Hardware store by putting in a gallery and running the shelving up to the ceiling.

That Chas. Thomas has purchased John Lundy's stock of Hardware at Monmouth, Iowa.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

White Lead.—In the market for this pigment there is no little irregularity, and the outlook is not particularly encouraging for an immediate change for the better. There has been some reaction from the exceedingly low prices for base material that have prevailed of late and upon which very low prices for dry White Lead and for Lead in Oil were made by producers not identified with the National Lead Company. This factor has had no perceptible bearing up to the present time, chiefly for the reason that sales of all varieties of White Lead have been considerably below the average for the season and that there is a good amount of White Lead in stock or in process made from material the average cost of which was below present market rates. In some quarters the opinion is ventured that the quantity is sufficient to meet a full average spring season demand. It is common report in the trade that reputable brands of Dutch process Lead in Oil have been sold at $5\frac{1}{4}\phi$, in round lots, and Dry White Lead at $\frac{3}{4}\phi$ @ 1ϕ less. The report is also going the rounds that relatively lower prices have been made in Western markets. That trade conditions are more or less adverse is clear, but superficial evidence is not wanting that the White Lead combine, like other similar aggregations, are making the most of existing opportunities to influence tariff legislation, and that the independent producers are lending a helping hand on their own account. Whatever the facts in this connection, it is clear that official price-lists are frequently lost sight of when it comes to the plain business affair of securing good orders. Briefly stated, the market is in buyers' favor.

Red Lead.—Competition in this pigment is not as keen as that which prevails in White Lead, but the struggle for business is by no means tame and list prices are the exception rather than the rule where orders covering good sized lots are involved. Western brands, in barrels have been sold at 5ϕ @ $5\frac{1}{4}\phi$, delivered here, or $\frac{1}{4}$ @ $\frac{1}{2}\phi$ under the N. L. T. list, but the Western people, it is intimated, are not the only ones who have cut prices. Foreign makes find very slow sale owing to the relative cheapness of the American product and the uncertainties regarding the tariff.

Litharge.—Low grades used by rubber manufacturers have met with somewhat better sale, but the prices were exceedingly low, say $4\frac{1}{2}\phi$ @ $4\frac{3}{4}\phi$ for stock in barrels, according to brand. The higher grades used by the Paint trade have not shared in the improvement and prices for the same seem to be quite well maintained.

Orange Mineral.—There has been nothing more than routine business in either foreign or domestic, and the market is bare of new features. Prices are wholly unchanged.

Zincs.—Deliveries of American Oxide have been liberal, and some im-

provement in new orders was also noted, but the latter are almost invariably small. Prices are steadier, particularly on the low grades, owing to reports of higher cost of crude material.

Colors.—Some improvement is noted in orders for leading lines of both Dry and Oil Colors, also in certain lines of ready mixed Paints, but the buying is hardly up to the average for the season and not sufficient to stiffen prices in any marked degree.

Oils and Turpentine.

Linseed Oil.—City crushers stand firm on the advance in prices quoted last week. The leading Western consumers are quite as firm at corresponding prices, and there is no irritating competition from other quarters. In point of fact aggressiveness is nowhere visible, and the market, for the time being, shows very good tone. Orders have been more numerous the past week than for some time past, but the buying is still on conservative lines and without evidence of any inclination on the part of jobbers or large consumers to buy except as well defined wants necessitate.

Cotton Seed Oils.—Fairly large purchases by prominent Western manufacturers of Lard compounds and by soap makers have served to give the market more tone. Besides this there has been some speculative interest that helped in the same direction and stiffened prices for both crude and refined Oils. It is estimated that nearly 15,000 barrels, or the equivalent in bulk, have been purchased for direct shipment from Southern points to the West. In the New York market several hundred barrels crude Oil were sold at 30ϕ @ $30\frac{1}{2}\phi$ for prime. The refined Oils have not fared quite as well, for the reason that export outlet expands very slowly, but after several lots of prime Summer Yellow were taken at 34ϕ @ $34\frac{1}{2}\phi$, sellers raised their price to 35ϕ and offered somewhat indifferently. Summer White sold at 38ϕ @ 39ϕ for prime and 40ϕ for strictly choice.

Lard Oil.—The depression in the market for raw material has had the effect of causing city pressers to reduce their price for prime Oil to 69ϕ , and receivers of outside brands made some sales at as low as 68ϕ . Subsequent reaction in the Lard market caused a withdrawal of cheap offerings, however, and at this writing the market shows better tone, with 70ϕ generally quoted for city brands of prime quality.

Fish Oils.—No change has taken place in the market for crude Sperm, Whale or Menhaden Oils. Export orders do not materialize, and home buyers are doing hardly anything in the absence of improvement in the demand for their goods. The pressed and bleached Oils are quoted at former prices, but find merely fair sale in jobbing quantities.

Olive Oil.—There has been a heavier movement in common Olive Oil, mainly of speculative nature and confined chiefly to a few operators in the goods, who frequently figure in similar speculations or market manipulation and generally unload on incipient "booms." As usual, the movement is accompanied by reports of higher prices in the foreign markets. Yellow Oil in barrels is now quoted at 64ϕ @ 66ϕ on the spot, and Green at about 60ϕ , while future shipments may be secured at 2ϕ @ 3ϕ less. The margin of difference in price is suggestive.

Spirits Turpentine.—Hardly any change has taken place in prices during the past week, and the business has been of strictly routine character, leaving the market flat and uninteresting. Late sales were at $30\frac{1}{2}\phi$ for the article in regular and 31ϕ in machine barrels.

Screen Door Hardware.

The accompanying cuts of spring hinges and door pull represent goods put on the market by Sargent & Co., 37

hinges have the springs covered, preventing rust, and adding to their appearance. Both have the holdback feature, holding the door open when the center is passed. The cast hinge is

may be placed upon the projecting end of the dasher itself. The can and the dasher are always given opposite motions and, the manufacturers claim, just as many motions as are necessary and

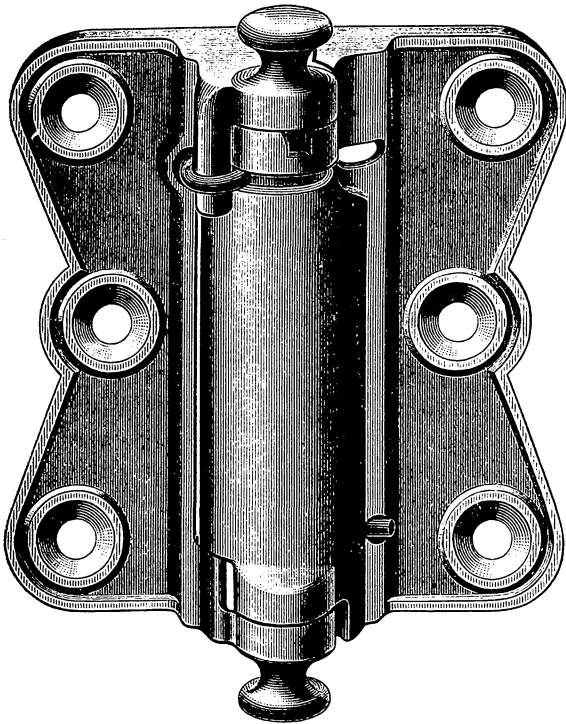


Fig. 1.—Hold Back Spring Hinge.

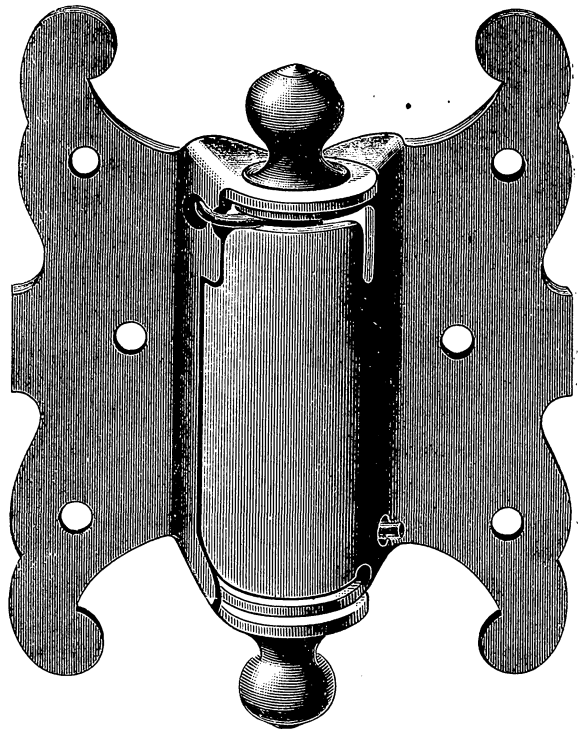


Fig. 2.—Wrought Steel Hold Back Spring Hinge.

Chambers street, New York. The hinges shown in Figs. 1 and 2 are constructed on the same principle, the

finished in japan, and both are shown full size in the cuts. Fig. 3 represents the steel wire door pull full size. These goods are japanned, and afford a neat and inexpensive pull.

The Ohio Freezer.

The cut herewith represents a freezer offered by the Sam'l C. Tatum Company, Cincinnati, Ohio. The manu-

no more ; also that while the dasher goes through the top of the housing there is no chance for oil or dirt to drop through into the can. Freezers with crank are made in 2, 3, 4, 6, 8, 10, 12, 16, 20 and 25 quart sizes, and with fly wheel in 16, 20 and 25 quart sizes.

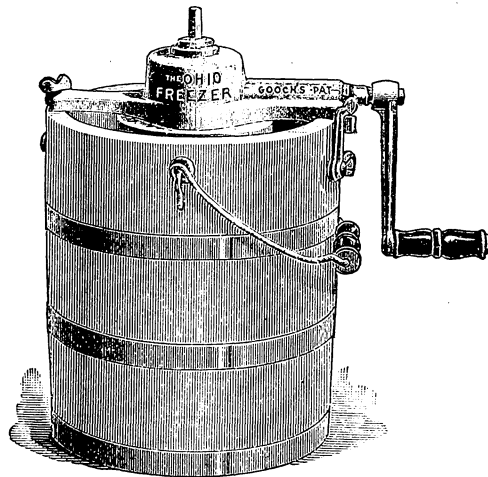
ON ACCOUNT of differences arising among stockholders the Toledo Bicycle Company, Toledo, Ohio, were placed



Fig. 3.—Steel Wire Door Pull.

one in Fig. 1, however, being cast iron, and that shown in Fig. 2 being made of wrought steel. The

facturers state that the principal feature is the thorough way in which the cream is stirred up from the bottom ; that there are no pockets left undisturbed, nor are there any places in the dasher to become clogged and difficult to clean, and that the dasher works clear out against the sides of the can. The dasher may be operated either from the side, as illustrated, or the handle

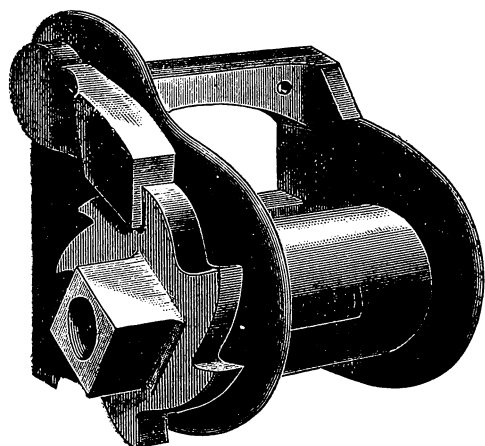


The Ohio Freezer.

in the hands of a receiver on January 25, 1894. We are advised that the invoiced assets are \$94,000, with liabilities of about \$60,000 ; also that under the receiver, T. B. Terry, all orders will receive prompt and careful attention, as the company are prepared to make shipments at once and continue the manufacture of their Dauntless wheels during the season of 1894.

I X L Wire Fence Ratchet or Tightener.

O. P. Schriver & Co., Pearl and Sycamore streets, Cincinnati, Ohio, are putting on the market the wire fence tightener shown herewith. The ratchet is designed to be put on the end posts of each 50 or 60 rod stretch of any make of fence wire, to draw and keep the wire perfectly tight. The wire may be stretched at any time by turning the



I X L Wire Fence Ratchet or Tightener.

square part on the ratchet with an ordinary wrench. It is pointed out that complete control is thus given of the fence, keeping it from sagging, breaking or becoming unsightly. To overcome the contraction of wire during cold weather the pawl can be thrown back and the wire slackened to prevent it breaking. It is claimed that the tightener saves time and labor and largely diminishes the number of fence posts required for a given distance.

The Whipple Screwless Door Knob.

The Perry & Whipple Company, 65 Orange street, New Haven, Conn., are introducing the screwless door knob shown in Fig. 1. The knob is secured to the spindle by means of a pawl or

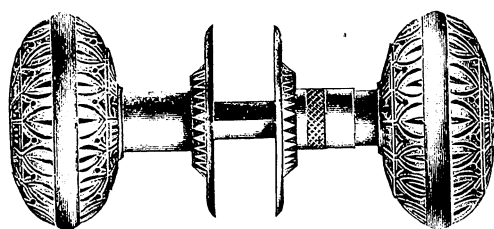


Fig. 1.—The Whipple Screwless Door Knob.

ratchet engaging with a series of notched teeth cut in the spindle, as shown in Fig. 2. The knurled collar is threaded internally to correspond with threads upon the knob neck, upon which it screws, thus riding over the pawl, which it forces into one of the notched teeth and holds securely in position. Between the knurled collar and the knob is a locking thimble which cannot be rotated upon the knob neck, but which follows the movement of the collar and is held against the collar by a spiral spring. The collar is provided with lugs, which enter recesses in the locking thimble, and when

so engaged prevent the collar from turning in either direction, thus preventing the collar unscrewing. In applying the knob to a door the spindle is passed through the door and the roses, and the free knob, having the

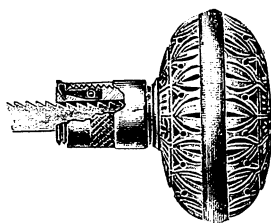


Fig. 2.—Pawl Raised.

pawl, collar and thimble attached, is slipped on the spindle until it bears lightly against the door, with the collar turned back on the knob neck so that the pawl may pass freely over the notches on the spindle. The locking thimble is then drawn back, allowing the collar to be turned over the pawl, as in Fig. 3, and until it comes against the rose. The thimble then being released, locks into the collar and prevents it from turning, holding the pawl in position and securing the knob firmly to the door. It is explained that the collar and thimble may be engaged at any point within a quarter turn, so that the knob can be adjusted perfectly to doors of different thickness, avoiding the end chase and general looseness

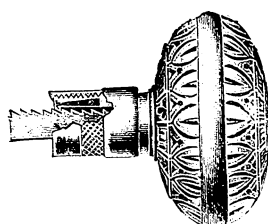


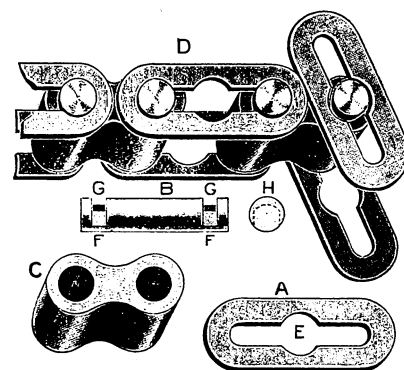
Fig. 3.—Pawl Locked to the Spindle.

of the ordinary knob. The point is made that there are no side screws or washers used in connection with the knobs, and that in operating the knob on the door there is no strain or friction upon any of the working parts, the construction being such as to unite all the parts solidly in engagement with each other so that there can be no play and consequent wear. The manufacturers state that the knob can be used with any make of lock. Knobs are made in some 50 different styles and finishes for rim and mortise locks.

The Baldwin Adjustable Bicycle Chain.

The accompanying cuts represent the adjustable bicycle chain put on the market by E. A. Baldwin, West Upton, Mass. D is a section of the chain, showing how it is put together. The chain has a slotted parallel side link. B is the barrel stud connecting the parallel side links to each other through the central block C. H represents a section of the barrel stud, dotted lines showing the cut out for adjustment. E is a sufficient enlargement of the slot in each side link to allow of the removal of the link over the head of the barrel stud, in order that the stud may be removed from the central block, or may be reversed in the slot of the side

link. The reason given for reversing the stud is as follows: As the chain wears in use it lengthens, and thus loosens, rattles and no longer fits the sprocket wheels. The way in which this device provides for retightening the chain and making it fit the sprocket wheels will be seen by referring to B, wherein F F are flat parallel slots, in which fit the inner edges of the side links A, sufficiently close to prevent the stud B from turning while in use, thus bringing the wear on the long bearings in the central block. G G are rounded slots, about $\frac{1}{2}$ inch in depth, to receive the inner end of the side link A when the chain is new and be-

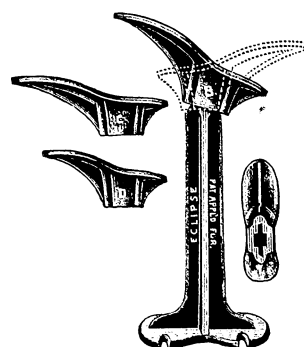


The Baldwin Adjustable Bicycle Chain.

fore it is slackened by wear. When the chain has become slack by use, one or more of the barrel studs may be turned half way over, so that the un-slotted side will bear against the inner edge of the side link A. Each barrel stud thus turned shortens the chain the depth of the slot G and lightens it to that extent, thus restoring the chain to its former pitch and making it fit the sprocket wheels the same as when new. The chain is furnished in $\frac{1}{2}$ -inch and $\frac{3}{4}$ -inch sizes, and is made to fit sprockets of 1 inch pitch, with $\frac{3}{4}$ -inch or $\frac{1}{2}$ inch central block. The manufacturer sends one extra link with each chain, for repairs in case of breakage, and warrants the material and workmanship of the chain.

Eclipse Reversible Iron Shoe Last.

John C. Kupferle, St. Louis, Mo., is offering the shoe last illustrated herewith. The stand is described as made



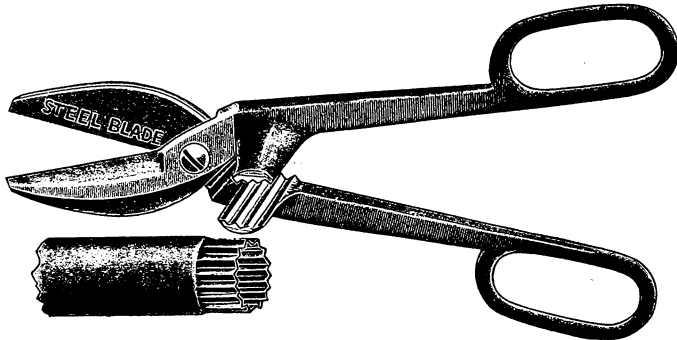
Eclipse Reversible Iron Shoe Last.

15 inches and 24 inches high, in a strong and durable manner. The clamp is so made that it will not wedge or break.

The Columbia Combined Snip and Crimper.

Below we present a new tool for tinners, invented by H. W. Smith, who gained fame previously by adding many good ideas to the trade, one of

to the pole. Spiral springs are employed to support the gangs and also to regulate the depth, the springs being adjustable. The wheels are 30 inches in diameter, made of steel. It is remarked that the machine is nicely painted and presents an attractive appearance. The manufacturers claim



The Columbia Combined Snip and Crimper.

which is his steel roof, manufactured by the Canton Steel Roofing Company, Canton, Ohio. This combined snip and crimper is manufactured by Ruth, Patterson & Ruth of Alliance, Ohio, who claim it to be a practical tool for making a complete joint in metal pipe, and it will find favor among tinners generally, for it obviates the "nick" or bending the pipe out of shape, and saves the snips from being sprung, as is liable to occur when crimped by the blades in the old way. The figure represents the combined tool. The crimping device is made to the snip directly back of the pivoted blades, with three teeth tapering to the end of the crimper so as to make a gradual crimp in the pipe. Its location gives sufficient leverage for easily making a perfect crimp, it is said, in sheet metal as heavy as No. 24 iron. The handles are made straight so that the snip can be reversed and the crimper will not interfere in cutting in corners, &c. The size is No. 8 of the regular tinners' snip.

The Spicer Walking Cultivator.

The new Spicer spring tooth walking cultivator, shown in the accompanying cut, is offered by the Spicer Mfg. Company, New Philadelphia, Ohio. The gangs are made of angle steel, securely bolted to a wood cross bar, on which the teeth are attached, making, it is stated, a strong and durable gang. It has an adjustable arch, the change being easily

the machine to be well made, simple in construction, strong and durable, and that it was thoroughly tested during the season of 1893 and proved a success in every particular.

The Columbian Rowlock.

The cuts here shown represent the Columbian rowlock with interchangeable

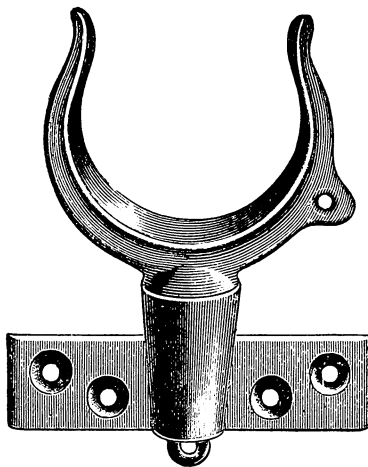
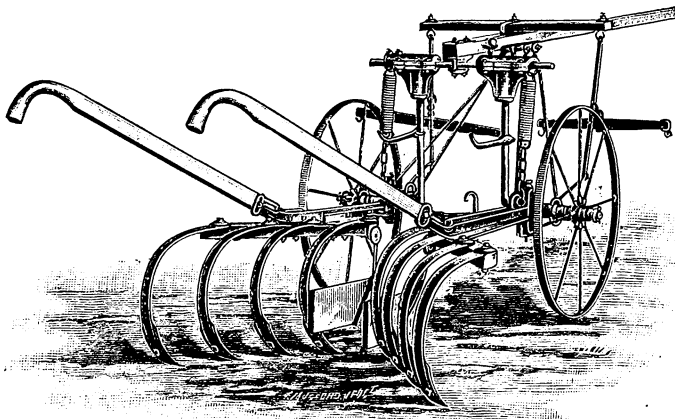


Fig. 1—Side Plate Columbian Rowlock.

able sockets, put on the market by Newhall Ship Chandlery Company, 105 Chambers street, New York. The goods are made in both galvanized gray iron



The Spicer Walking Cultivator.

made by loosening the clamp bolts on the top of the arch. The arch is supported and held in place by four $\frac{5}{8}$ -inch round braces, extending from the axles

and malleable iron. The line made includes the following sizes, the measurements indicating the distance in inches between the horns: No. 0, 1 $\frac{1}{4}$ inches;

No. 1, 2 inches; No. 2, 2 $\frac{1}{4}$ inches; No. 3, 2 $\frac{1}{2}$ inches and No. 4, 3 inches. Nos. 0, 1 and 2 are furnished with either side plates, as in Fig. 1, thus allowing the dealer to carry a number of horns and a

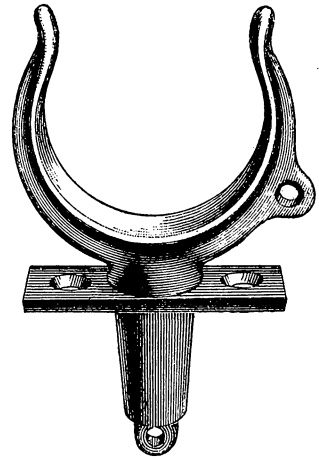
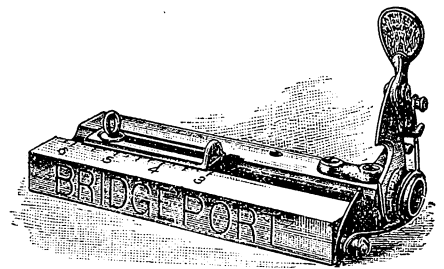


Fig. 2.—Regular Socket Columbian Rowlock.

corresponding number of side plates and sockets assorted, as the horns work in either the side plates or sockets. Nos. 3 and 4 are furnished with regular sockets only. The manufacturers refer to the goods as light, strong and graceful.

The Bridgeport Cigar Tuck Cutter.

Charles A. Wheeler, 108 Catherine street, Bridgeport, Conn., is offering a cigar tuck cutter, as herewith illustrated. The cutter is made with a wood base 6 $\frac{1}{4}$ inches long, grooved out for the reception of the cigar, with a measure gauge stamped in figures on the block. In connection with the figures is an adjustable metal gauge secured by a thumb screw, which is set in determining the length of the cigar.



The Bridgeport Cigar Tuck Cutter.

There are upper and lower knives made of cast steel, with the cutting edges coved out to inclose the cigar around, so that the outside of the cigar is first cut, and as the pressure on the lever is increased the cutting is finished at the center to avoid breaking the cigar. The under blade can readily be raised or lowered by loosening a screw so as to suit any sized cigar. The metal gauge can be turned end for end should the cigar maker wish to avoid having the cigar head touch the gauge. The cutter is fastened to the bench by a screw, and will cut, it is claimed, clean and square and will not split the tuck or flatten the cigar.

The interest bearing debt of the United States on December 31, 1893, was \$385,039,310. The debt on which interest has ceased was \$1,939,380, and that bearing no interest \$376,653,076.

Current Hardware Prices.

JANUARY 31, 1894

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10 to 50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Adjusters, Blind—

Domestic..... \$ doz \$3.00, 33% @ 33% & 10%
Excellior..... \$ doz \$10.00..... 11@11%
North's..... \$ doz \$10.00..... 11@11%
Zimmerman's—See Fasteners Blind.

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—

American—

Eagle Anvil, \$ 96..... 15@15&5
Horse shoe brand, Wrought..... 11@11%
Moore & Barnes Mfg. Co..... 33%

Imported—

Armature Mouse Hole..... 10% @ 11%
S. & H. machine finished..... 10% @ 11%
Trenton..... 10% @ 10%
Wilkinson's..... 10% @ 11%
Peter Wright's..... 11@11%

Anvil Vise and Drill—

Allen Anvil and Vise \$3.00..... 40&10%
Cheney Anvil and Vise..... 25%
Millers Falls Co., \$18.00..... 20%
Star..... 45&5

Apple Parers—See Parers Apple, &c.

Augers and Bits—

Boring Machine Augers..... 70@70&10%
Car Bits, 12-in. twist..... 50%
Common Augers and Bits..... 70@70&10%
Cincinnati Bell-Hangers Bits..... 30&10
Forstner Pat. Auger Bits..... 15%
Jennings' Pattern Auger Bits..... 40%
Jennings' Pattern Auger Bits..... 40%
C. E. Jennings & Co., No. 10, extension lip..... 40%
C. E. Jennings & Co., No. 30..... 60%
C. E. Jennings & Co., Auger Bits, set 32% quarters, No. 5, \$5; No. 30, \$5.50, 25%
Russell Jennings Augers and Bits..... 25&10%
Lewis' Patent Single twist..... 45%
L'Hommedieu Car Bits..... 15&10%
Pugh's Black..... 20%
Pugh's Jennings Pattern..... 30%
Snell's Bits..... 60&5

Bit Stock Drills—

Cleveland..... 50&10&5%
Cincinnati, for wood..... 30&10%
Cincinnati, for metal..... 45&10%
Morse Twist Drills..... 50&10&5%
New Process Twist Drill Co..... 50&10&5%
standard..... 50&10&5%
Syracuse, for metal..... 50&10&5%
Syracuse, for wood (wood list), 50@30&5%

Expansive Bits—

Clark's small, \$18; large, \$25..... 35@35&10%
Ives' No. 4, \$ doz \$60..... 40%
Stearns, No. 1, \$25; No. 2, \$18..... 35&10%
Stearns' No. 2, \$24..... 20%
Swan's..... 40%

Gimlet Bits—

Bee..... 25@25&5%
Common..... \$ gross \$2.75 @ \$3.25
Diamond..... \$ doz \$1.25..... 40&10%
Double Cut..... 45&10%
Shepardson's..... 45&10%
Ct. Valley Mfg. Co..... 30&10%
Hartwell's..... \$ gro., \$10.00..... 40&10%
Douglass..... 40&10%
Ives..... 60&10%
Ives'..... 30% @ 33% & 10%

Hollow Augers—

Bonney's Adjustable, \$ doz \$48..... 50%
Cincinnati Adjustable..... 25&10%
Cincinnati Standard..... 25&10%
Douglass..... 33% @ 33% & 10%
French, Swift & Co. (Beecher)..... 33% @ 33% & 10%
Ives'..... 33% @ 33% & 10%
Ives' Expansive, each \$4.50..... 50&5%
Stearns..... 20&10%
Universal Expansive, each \$4.50..... 20%
Wood's..... 25&10%
Ship Augers and Bits—
L'Hommedieu's..... 15&10% @ 15&10% & 5%
Snell's..... 25&10%
Snell's Ship Auger Pat'n Car Bits..... 15&10% @ 15&10% & 5%
Watrous..... 25&10%

Awl Hafts—See Hafts, Awl.

Awls—

Awls, Sewing, Common..... \$ gr. 85¢ @ 90¢
Awls, Sewing, Peg..... \$ gr. \$1.50 @ \$1.55
Awls, Pat. Peg..... \$ gr. 35¢ @ 38¢
Awls, Shouldered Brad..... \$ gr. \$1.30 @ \$1.40
Awls, Handled Brad..... \$ gr. \$2.50 @ \$2.60
Awls, Handled Scratch..... \$ gr. \$4.00 @ \$4.50
Awls Socket Scratch..... \$ doz \$1.10 @ \$1.20

Awl and Tool Sets—See ts, Awl and Tool.

Axes—

First quality, best brands..... \$7.00
First qual., other brands..... 6.50
Second quality..... 6.50

Axle Grease—See Grease, Axle.

Axles—

No. 1..... 3 1/4 @ 4 1/4; 4 1/4 @ 5 1/4
Nos. 7 to 14..... 4 1/4 @ 5 1/4
Nos. 15 to 28..... 4 7/8 @ 5 1/4
Nos. 19 to 22..... 70%
Concord Axles, loose collar..... 3% cash
Concord Axles, solid collar..... 56¢ @ 6¢

Bag Holders—See Holders, Bag.

Balances—

Pullman..... 33%
Spring Balances..... 40%
No. 2000 20 50
Chatillon, \$ doz..... \$0.80 0.95 1.75 net
Chatillon Straight Balances..... 40%
Chatillon Circular Balances..... 50&10%

Barb Wire—See Wire, Barb.

Bars—

Cast Steel..... \$ D 3 1/4
Iron, Steel Points..... \$ D 3 1/4

Basins, Wash—

Standard Fiberglass, No. 1, 10 1/2-in., \$1.80;
12-inch, \$2.00; 13 1/4-inch, \$2.50; 16-inch, \$3.00.

Beams, Scale—

Scale Beams, List Jan. 12, '82, 50&10%
Chatillon's No. 1..... 50&10%
Chatillon's No. 2..... 50%
Custer's..... 33%

'Beaters—

Bryant's..... \$ gross \$14.00
Double (H. & R. Mfg. Co.), \$ gro., No. 0 \$12.00; No. 1, \$15.00; No. 2..... \$38.00
Dover..... \$ doz \$1.00 @ \$1.20
Dover (Standard Co.)..... \$ doz \$1.00
Duplex (Standard Co.)..... \$ doz \$1.00
Duplex Extra Heavy (Standard Co.)..... \$ doz \$3.50
Easy (H. & R. Mfg. Co.)..... \$ gro \$12.00
Improved Acme (H. & R. Mfg. Co.)..... \$ gro \$9.00
Silver & Co..... \$ doz \$5.50
Spiral..... \$ gro \$4.25 @ \$4.50
Triple (H. & R. Mfg. Co.)..... \$ gro \$16.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2..... 20%

Bells—

Common Wrought..... 60&10%
Kentucky Durham..... 70&10%
Kentucky, Sargent's list..... 70&10%
Kentucky, "Star"..... 20&10%
Texas Star..... 50&10% @ 50&10% & 5%
Western, Sargent's list..... 70&10%

Door—

Crank, Brooks'..... 50&10&5%
Crank, Cone's..... 10%
Crank, Cone's..... 20&10%
Gong, Abbe's..... 38% @ 10%
Gong, Barton's..... 40&10% @ 50%
Gong, Yankee..... 45&10%
Lever, R. & E. Mfg. Co.'s..... 60&10%
Lever, Taylor's Bronzed or Plated..... net
Lever, Taylor's Japanned..... 25&10%
Pul, Brooks'..... 50&10&5%

Electric—

Bigelow & Dowse..... 20%
Wollensak's..... 20%

Hand—

Extra Heavy Brass..... 70%
Light Brass..... 70&10% @ 70&10% & 5%
Silver Chime..... 33% @ 10%
White..... 70%
Globe Cone's Patent..... 25&10% @ 35%

Miscellaneous—

Call..... 45&50%
Farm Bells..... \$ D 3 1/4 @ 3 1/2
Steel Alloy Church and School Bells..... 40%

Bellows—

Blacksmith's..... 60&10% @ 60&10% & 10%
Hand Bellows..... 40&10% @ 50%
Molders'..... 40&10% @ 50%

Belting, Rubber—

Common Standard..... 75&75%
Extra..... 60&10% @ 60&10% & 10%
Standard..... 70&5% @ 70&10%
N.Y.B. & P. Co., Carbon..... 60&50%
N.Y.B. & P. Co., Diamond..... 50&50%
N.Y.B. & P. Co., Para..... 40&10% & 5%

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender..... 15%
Green River Tire Benders and Upsetters..... 20%
Stoddard's Lightning Tire Upsetters..... 15%

Bits—

Auger, Gimlet, Bit Stock Drills, &c., see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Cleveland Block Co., Mal. Iron, 5 1/2 @ 6 1/4
Moore's Novelty, Mal. Iron..... 60%
Sure Grip Steel Tackle Blocks..... 25%
See also Machines, Hotsting.

Bolts—

Carriage, Machine, &c.—

Com. list June 10, '84..... 80&10%
Genuine Eagle, Norway, list Oct. '84..... 80&5% @ 80&10%
Eagle, Norway, list Oct. '84..... 80&5% @ 80&10%
Phila. pattern, list Oct. 7, '84..... 80%
R.B. & W., old list..... 70%
Boit Ends, list Jan. 1, 1890, 80&10% @ 80&20%
Machine, list Jan. 1, 1890, 80&10% @ 80&20%

Door and Shutter—

Cast Iron Barrel, Square, &c..... 70&10%
Cast Iron Chain (Sargent's list)..... 65&10%
Cast Iron Shutter Bolts..... 70&10%
Ives' Patent Door Bolts..... 60&10% @ 60&10% & 5%
Wrought Barrel..... 70&10% @ 75%
Wrt B. K. Flush, Common..... 55&10%
Wrt Shutter, Brass Knob..... 50&50%
Wrt Shutter, Sargent's list..... 60&10%
Wrt Shutter, all iron, Stanley's..... 60&10% @ 60&10% & 5%
Wrought Square..... 70&10% @ 75%
Wrt Sunk Flush, Sargent's list..... 60&10%
Wrt Sunk Flush, Stanley's list, 50&10% & 5%

Stove and Plow—

Plow..... 60&10% @ 60&10% & 10%
Stove..... 60&10% @ 60&10% & 10%
R. B. & W., Plow..... 55%

Tire—

Common, list Feb. 28, '83..... 65@65&5%
American Screw Company..... 75%
Norway, Phila., list Oct. 16, '84..... 80%
Eagle, Phila., list Oct. 16, '84..... 80%
Phila., list Oct. 16, '84..... 80%
Bay State, list Feb. 28, '83..... 65%
Port Chester Bolt and Nut Company:
Empire list Feb. 28, '83..... 65%
Keystone, Philadel., list Oct. '84..... 80%
Norway, Phila., list Oct. '84..... 75%
R. B. & W., Philadel., list Oct. 16, '84..... 80%

Borers, Tap—

Common and Ring..... 20&10%
Clark's..... 33% @ 35%
Enterprise, Phila. Co..... 20%
Ives' Tap Borers..... 33% @ 35%

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon—

Per m..... 2%

Boxes, Miter.

Spilker's Excellior, 3 in. \$7.50, 4 in. \$8.50, 5 in. \$13.00, 6 in. \$15.00..... 20%

Braces—

American Bit Brace and Tool Co..... 60&10%
Nos. 10, 12, 20..... 60&10%
Nos. 11, 21, 24, 27..... 70&10%
Nos. 22, 23, 25..... 60&10%
Nos. 26, 28, 30, 37..... 70&10%
Amidon's:
Barker's Imp'd Plain..... 75&10% @ 80%
Barker's Imp. Nickle..... 65&10% @ 70%
Ratchet..... 75&10% @ 80%
Eclipse Ratchet..... 60%
Globe Javed..... 40% @ 40&10%
Corner Brace..... 40% @ 40&10%
Universal, 8 in., \$2.10; 10 in. \$2.25
Buffalo Ball..... \$1.10 @ \$1.15
Barber's..... 60&10%
Bartholomew's:
Nos. 25, 27 and 30..... 50&10% @ 60&5%
Nos. 117, 119, 119..... 70&10%
Common Ball, American..... \$1.00 @ \$1.10
Davis Patent..... 60&10%
Fray's Genuine Spofford's..... 50&50% @ 60&10%
Fray's Nos. 70 to 120, 81 to 123, 207 to 414..... 60&10%
Ives' New Haven Novelty..... 70&70&5%
New Haven Ratchet..... 60&50% @ 60&10%
Barber Ratchet..... 60&50% @ 60&10%
Barber's..... 60&50%
Spofford..... 60&50% @ 60&10%
P. S. & W. Co., Peck's Patent..... 60%
Rose & Johnson..... 50%
Saxton's:
Barker's Imp. Polished..... 75&10% @ 80%
Barker's Imp. Nickle..... 65&10% @ 70%
Ratchet, Polished..... 60&10% @ 60%
Ratchet, Nickle..... 40&10% @ 50%
Buffalo Ball..... net, \$1.10 @ \$1.15

Brackets—

Shelf, plain..... 70&70%
Sargent's list..... 70&70%
Other makes at a wide range of prices.
Shelf, plain..... 65@70%
Sargent's list..... 60&10% @ 70&10%
Bradley Shelf Brackets..... 70&10%

Bright Wire Goods—See Wire.

Broilers—

Hen's Self-Inch..... 9 10 9 11
Basting, \$ per doz..... \$4.50 5.50 6.50
Morgan Odorless..... \$ doz \$12.50
New Haven..... 50%
Queen City..... 33%
Wire Goods Co..... 65&10%

Buckets, Well—

Helwig's Flat Iron Band..... \$3.75
Helwig's Wired Top..... \$ doz \$4.00
Hill's..... \$ doz 12 qt. \$4.25; 14 qt. \$5.25
Iron Clad..... \$ doz 14 qt. \$4.25 @ \$4.50

Bull Rings—See Rings, Bull.

Butcher's Cleavers—See Cleavers, Butchers.

Butts—

Cast Brass, Fast..... 33% @ 10%
Cast Brass, Loose Joint..... 33% @ 10%
Cast Brass, Tiebout's..... 50%
Wrought Brass..... 80% @ 80&10%

Cast Iron—

Fast Joint, Broad..... 50&10% @ 60%
Fast Joint, Narrow..... 50&10% @ 60%
Loose Joint, Japanned..... 75&50
Loose Joint, Jap. with Acorns..... 75&10
Loose Pin, Acorns, Japanned..... 75&10
Loose Pin, Acorns, Japanned, &c.
Plated Ties..... 50%
Mayer's Hinges..... 50%
Parliament Butts..... 50% @ 50&10%

Wrought Steel—

Fast Joint, Broad..... 50&10%
Fast Joint, Narrow..... 50&10%
Fast Joint, Lt. Narrow..... 50&10%
Inside Blind, Light..... 74@84
Inside Blind, Regular..... 74@84
Loose Joint, Broad..... 50%
Loose Pin..... 50%
Table Butts, Back Flaps, &c..... 50% @ 50&10%
Bronzed Wrought Butts..... 50% @ 50&10%

Cages, Bird—

Hendryx, Brass or Enameled..... 50&10%
Hendryx, Wood..... 40&10%

Calipers—See Compasses

Calks Toe—

Burke's, One Front, Blunt..... 5% @ 6¢
Burke's, One Front, Sharp..... 6% @ 7¢
Burke's, Two Front, Blunt..... 74@84
Gautier, One Front, Blunt..... 5% @ 6¢

Can Openers—See Openers, Can.

Cans, Milk—

S. S. & Co.: 5-gal., \$3.00; 8-gal., \$4.40;
10-gal., \$4.75 each..... 40&10

Cans, Oil—

Galvanized Blue Band, 1 gal., \$ doz \$2.25
Galvanized Blue Band, 5 gal., Tip-Top..... \$ doz \$12.00
Galvanized Blue Band, 5 gal., Faucet..... \$ doz \$8.00
Glass Oil, Friend..... \$ doz \$2.75

Caps—

Hicks & Goldmark's and Union Metallic Cartridge Co..... \$ 1000
Eley's E. B..... 50¢ @ 55¢
Eley's D Waterproof, Central Fire \$1.60
E. B. Grad. Edge, Cent. Fire, 1-10's..... 47@50¢
E. B. Trimmed Edge, 1-10's..... 47@50¢
F. L. Waterproof, 1-10's..... 35¢ @ 37¢
G. D..... 27¢ @ 30¢
Musket. Waterproof, 1-10's..... 50¢ @ 55¢
S. B. Genuine Importers..... 45¢

Primers—

Berdan Primers, \$1.00..... 25¢
B. L. Caps (Sturtevant Shells) \$1.00..... 25¢
All other Primers, \$1.20..... 25¢

Cards—

Watson's Cotton, Wool, Horse and File, list January 23, 1891..... 25%

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

B. B. Caps, Con. Ball, Swgd., \$2.00..... 25¢
B. B. Caps, Round Ball, \$1.75..... 25¢
Blank Cartridges, except 22 and 32 cal., additional 1 lb. to above discounts.
Blank Cartridges, 22 cal., \$1.75..... 25¢
Blank Cartridges, 32 cal., \$3.50..... 25¢
Cent. Fire, Military and Sporting..... 15&5¢ @ 25¢
Cent. Fire, Pistol and Rifle..... 25&5¢ @ 25¢
Primed Shells and Bullets..... 15&5¢ @ 25¢
Rim Fire Cartridges..... 15&5¢ @ 25¢
Rim Fire Military..... 15&5¢ @ 25¢

Carpet Sweepers—

See Sweepers, Carpet.

Casters—

Bed..... \$ Brass..... 55¢ @ 55&10%
Plate..... \$ Others..... 60¢ @ 60&10%
Shallow Socket..... 40&10%
Deep Socket..... 40&10%
Giant Truck Casters..... 35%
Gwinner's Common Sense..... 45%
Gwinner's Hercules..... 45%
Martin's Patent (Phoenix) 45&10% @ 50&10%
Payson's Anti-friction..... 70&70&10%
Payson's Truck..... 60&60&10%
Socket Truck Casters..... 50¢ @ 60&10%
Stationary Truck Casters..... 50¢ @ 60&10%
Tucker's Patent, low list..... 45%
Yale Casters, low list..... 45%
Yale, Gem..... 70%

Cattle Leaders—

See Leaders, Cattle.

Cement—

Victor Elastic..... 5 lb pails \$ 10

Chain—

American Coll, in cask lots, 3-10 1/2 7-18 1/2 3-10 3-25 7-30 5-30 4-45 3-30 3-30 3-30 3-25 less than cask lots, add 4¢ @ 5¢
German Coll, list July 12, 1892 60&10%
German Halter Chain, list July 12, 1892, 60&10%
Trace, Wagon and Fancy Chains, list revised May, 189

Chalk Lines—See *Lines*.
Checks, Door—
Unity.....50%
Chisels—
Socket Framing and Firmer
Mix
New Haven.....75%100%75%10%10%
Ohio Tool Co.....
P. S. & W.....
Wetherby.....
Buck Bros.....30%
Douglass.....75%75%25%
Merrill.....60%100%60%30%25%
L. & J. J. White.....60%30%25%
Tanged and Miscellaneous
Buck Bros.....30%
Butchers'.....\$4.75 to \$5.00 to 2
Cold Chisels, fair quality, 10 14 16
Spear & Jacksons.....\$5 to 2
Tanged Firmer.....50%50%10%

Chucks—
Beach Pat.....each \$8.00.....20%
Danbury.....each \$8.00, 30%30%25%
Graham Patent.....33%4%
Morse's Adjustable, each, \$7.00, 20%20%25%
Syracuse, Balz Pat.....25%
Skinner's Patent Chucks.....33%4%
Combination Lathe Chucks.....15%
Drill Chucks.....15%
Independent Lathe Chucks.....40%
Universal Lathe Chucks.....40%
Union Mfg. Co.....40%
Combination.....40%
Independent.....40%
Universal.....40%
Victor.....\$3.50, 25%

Churns—
McDermald Star Barrel Churn, each
6 gal., \$2.00; 10 gal., \$2.75; 15 gal.,
\$3.00; 20 gal., \$3.25.
Tiffin Union, each, 5 gal. \$3.25; 7 gal.,
\$2.75; 10 gal., \$4.25.
Clamps—
Adjustable, Cincinnati.....15%10%
Adjustable, Hammers.....16%15%25%
Adjustable, Stearns.....30%30%10%
Barnes' Machinists' Clamps.....33%4%
Cabinet, Sargent's.....70%10%
Carpenter's, Cincinnati.....25%10%
Carriage Makers, P. S. & W. Co., 40%10%
Carriage Makers', Sargent's.....75%75%25%
Eberhard Mfg. Co., 40%5%40%10%
R. I. Tool Co.'s Wrought Iron.....25%
Saw Clamps, see Vices, Saw Filers'
Stearns' Adjustable Cabinet and Cor-
ner.....30%30%10%
Warner's.....40%10%40%10%25%

Cleavers, Butchers—
Beatty's.....40%40%25%
Bradley's.....25%30%
Foster Bros.....30%
New Haven Edge Tool Co.'s.....40%
Nichols Bros.....30%
P. S. & W.....33%25%33%10%
Schulte, Lohoff & Co.....40%40%25%
L. & J. J. White.....20%25%

Clips—
Baker Axle Clips.....25%
Norway, Axle, 1/2 & 5-16.....55%25%25%
Norway Spring Bar Clips, 5-16.....60%25%25%
24 grade Norway Axle, 1/2 & 5-16.....55%25%25%
Steel Felloe Clips.....60%25%25%
Superior Axle Clips.....60%25%25%
Wrought Iron Felloe Clips.....10%
Cloth and Netting, Wire
—See *Wire*, &c.

Cockeyes.....50%
Cocks Brass—
Hardware list (Globe, Kerosene, Lever
Bibbs, Racking, &c.).....60%2%60%10%
Coffee Mills—See *Mills, Coffee*.
Collars Dog—
Brass, Pope & Steven's list.....40%
Chapman Mfg. Company, new list.....40%
Embossed, Gilt, Pope & Steven's list,
30%10%
Leather, Pope & Steven's list.....40%
Medford Fancy Goods Co.....40%10%50%

Combs Curry—
American Curry Comb Co.....33%40%
Fitch's.....50%100%50%10%10%
Gibbs' Magnetic.....\$ doz., \$2.00
Kohler's Humane.....\$ doz., \$1.75
Kohler's Magic Oscillating.....\$ doz., \$2.00
Rubber, per doz., \$10.00.....25%

Compasses, Dividers &c.
Compasses, Calipers, Dividers, 70%10%75%
Bemis & Call Co.'s
Dividers.....85%
Calipers, Call's Patent Inside.....65%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....80%
Compasses.....50%25%
Excelior.....50%
Starrett's
Combination Dividers.....25%
Lock Calipers and Dividers.....25%
Spring Calipers and Dividers.....25%10%
Stevens & Co.'s.....25%10%

Coolers, Water—
S. S. & Co., 2-gal., \$2.00; 3-gal., \$2.50;
4-gal., \$2.75; 6-gal., \$3.40 each.....33%4%
Coopers' Tools—
See *Tools, Coopers'*.
Cord Sash—
Braided, Crown Drab and Fancy, 1/2
in, 55%
Braided, Crown White, 1/2 in, 50%
Cable Laid Italian Sash.....1/2 in, 19%20%
Common.....1/2 in, 8%40%
Common Russia Sash.....1/2 in, 12%18%
Egyptian, India E. P., Braided.....20%
India Cable Laid Sash.....1/2 in, 11%40%
Massachusetts, White.....25%
Ossawa Mills
Braided, Giant, Drab and Fancy, 1/2
in, 25%
Braided, Giant, White, 1/2 in, 30%
Patent, good quality.....1/2 in, 10%11%
Patent Russia Sash.....1/2 in, 13%40%14%

Samson—
Braided, Drab Cotton.....1/2 in, 42%
Braided, Italian Hemp.....1/2 in, 40%
Braided, Linen.....1/2 in, 56%
Braided, White Cotton.....1/2 in, 37%
Semper Idem, Braided, White.....20%
Silver Lake
A quality, Drab, 55%
A quality, White, 50%
B quality, Drab, 85%
B quality, White, 30%
Sylvan Spring, Extra Braided, Drab, 30%
Sylvan Spring, Extra Braided, White, 34%
Tate's Solid Braided.....1/2 in, 27%
Economy, White.....1/2 in, 22%
Hercules, Drab.....1/2 in, 30%
Hercules, White.....1/2 in, 25%
White Cotton Braided, fair.....1/2 in, 23%24%

Wire Picture—
Braided or Twisted.....80%25%80%15%
Corkscrews—See *Screws, Corks*.
Corn Knives and Cutters
—See *Knives, Corn*.
Crackers, Nut—
Acme
Japaned, 1/2 gro., \$30.....50%
Nickel Plated, 1/2 gro., \$30.....10%
Blake's Pattern, 1/2 doz., \$2.00.....10%
Table (H. & B. Mfg. Co.).....40%
Turner & Seymour Mfg. Co.....50%

Cradles—
Grain.....50%2%50%5%2%

Crayons—
White Crayons, 1/2 gross.....7%8%
D. M. Steward Mfg. Co.,
Metal Workers', 1/2 gross, \$2.50.....25%
Railroad, 1/2 gross, 2.00.....25%
Rolling Mill, 1/2 gross, 2.50.....25%
Saw Pencils, 1/2 gross, 1.50.....25%
See also *Chalk*.

Creamery Pails—See *Pails, Creamery*.
Crow Bars—See *Bars, Crow*.
Curry Combs—
See *Combs, Curry*.
Curtain Pins—
See *Pins, Curtain*.
Cutters—
Meat—
American.....1/2 doz., \$1.00.....30%
Nos. 1 2 3 4 5 6
Each.....\$5 \$7 \$10 \$25 \$50 \$80
Enterprise.....10 12 20 30 40 50
Each.....\$3 \$2.50 \$4 \$6 \$15
Dixons', 1/2 doz.....40%40%25%
Nos. 1 2 3 4 5 6
Each.....\$14.00 \$17.00 \$19.00 \$30.00
Draw Cut, each.....
Nos. 5 12 6 8
\$50 \$75 \$80 \$225.....20%25%
Hale's, 1/2 doz.....70%
Nos. 11 12 13
\$27.00 \$33.00 \$45.00
Home No. 1, 1/2 doz., \$26.00.....55%10%
Little Giant, 1/2 doz.....40%10%50%
Nos. 305 310 312 320 322
\$35.00 \$48.00 \$44.00 \$72.00 \$68.00
Miles' Challenge, 1/2 doz.....45%45%10%
Nos. 1 2 3
\$22.00 \$30.00 \$40.00
Triumph No. 505, 1/2 doz., \$21.00.....25%30%
Woodruff's, 1/2 doz.....40%40%25%
Nos. 100 110 120
\$15.00 \$18.00
Beef Shavers (Enterprise).....20%
Chadborn's Smoked Beef Cutter, 1/2 doz.,
\$66.00

Slaw and Kraut—
Tucker & Dorsey Mfg. Co.:
Kraut Cutters, 1/2 doz.....40%
Slaw Cutters, 1 Knife, 1/2 gross.....\$21.00
Slaw Cutters, 2 Knife, 1/2 gross.....30.00

Tobacco—
Acme.....1/2 doz., \$20.00, 40%
All Iron.....1/2 doz., \$4.25
Champion.....20%10%30%
Nashua Lock Co.'s, 1/2 doz., \$18.00, 50%55%
Sargent.....1/2 doz., \$24.00, 55%10%
Wilson's.....1/2 doz., \$16.00.....55%

Washer—
Appleton's.....1/2 doz., \$16.00, 60%10%
Bonney's.....30%10%
Cincinnati.....25%10%
Johnson's.....1/2 doz., \$11.00, 33%4%
Penny's, 1/2 doz., Pol. \$14 Jap'd, \$16, 55%
Smith's Pat.....1/2 doz., \$12.00, 20%10%10%

Diggers, Post Hole, &c.—
Cronk's Post Bars, 1/2 doz., \$80.00,
50%25%50%10%
Eureka Diggers.....1/2 doz., \$12.00, 33%10%
Fletcher Post Hole Augers, 1/2 doz., \$36.00,
20%20%10%
Gem, Improved 1/2 doz., \$9.00, \$10.00 net
Gibbs' Columbia.....1/2 doz., \$12.00
Gibbs' Hunter.....1/2 doz., \$10.00
Gibbs' Imperial.....1/2 doz., \$8.50
Gibbs' National.....1/2 doz., \$12.00
Gibbs' Post Hole Digger.....1/2 doz., \$12.75
Kohler's Hercules.....1/2 doz., \$14.00
Kohler's Invincible.....1/2 doz., \$12.00
Kohler's Little Giant.....1/2 doz., \$18.00
Kohler's New Champion.....1/2 doz., \$25.00
Samson, 1/2 doz., \$34.00.....25%25%10%
Schneider.....1/2 doz., \$18.00
Shimer's Hollow Handle.....1/2 doz., \$24.00,
50%
Vaughan's Post Hole Auger, 1/2 doz.,
\$8.50 to \$9.50

Dividers—See *Compasses*.
Dog Collars—See *Collars, Dog*.
Door Checks—
See *Checks, Door*.
Door Springs—
See *Springs, Door*.
Drawers—
Money, 1/2 doz.....\$18%40%
Waddell's Improved, No. 1, 1/2 doz., \$12.00
Waddell's Improved No. 2, 1/2 doz., \$18.00
Waddell's Desk and Drawer, each \$7.50
Waddell's Desk and Show case, each \$7.50
Drawing Knives—
See *Knives, Drawing*.
Drills and Drill Stocks—
Blacksmiths'.....each \$1.75
Blacksmiths' Self-Feeding, each \$7.50, 20%
Automatic Boring Tools.....\$1.75 to \$1.85
Breast, Bartholomew's.....each \$2.50,
25%10%40%
Breast, Millers Falls.....each \$3.00, 25%
Breast, P. S. & W.....40%10%
Breast, Wilson's.....40%10%
Chicopee Automatic Drill.....20%10%
Goodell Automatic Drills.....40%25%
Ratchet, Curtis & Curtis.....30%
Ratchet, Ingersoll's.....25%
Ratchet, Merrill's.....20%20%25%
Ratchet, Moore's Triple Action.....25%30%
Ratchet, Parker's.....20%20%25%
Ratchet, Weston's.....20%25%
Ratchet, Whitney's.....20%25%
Whitneys Hand Drill, Plain, \$11.00,
Adjustable, \$12.00.....20%10%
Twist Drills—
Cleveland, W. & B.....60%10%10%
Diamond, W. & B.....60%10%10%
Graham's Pat. Groove Shank, 60%10%10%
Morse.....60%10%10%
New Process.....60%10%10%
Standard.....60%10%10%
Syracuse (Metal list).....60%10%

Drill Bits or Bit Stock
Drills—See *Augers and Bits*.
Drill Chucks—See *Chucks*.
Dripping Pans—
See *Pans, Dripping*.
Drivers, Screw—
Allard's Spiral, new list.....25%
Brace Screw Drivers.....25%10%
Buck Bros.....30%
Buck Bros', Screw Driver Bits.....27%25%
Bark's Pat.....30%33%4%
Champion.....25%10%
Clifton's.....50%
Douglass Mfg. Co.....30%20%10%
Ellrich's Socket and Ratchet, 25%25%10%
Fray's Hol. H. die Sets, No. 3, \$12.00, 45%
Gay & Parsons.....30%
Goodell's Automatic.....50%
Knapp & Cowles.....60%20%70%
No. 1.....60%10%10%70%5%
No. 2.....60%10%10%70%5%
No. 3.....60%5%60%10%
Nos. 4 and 00, Acme and Ideal.....50%5%
Goodell's Common Sense.....1/2 doz., \$8.00,
25%10%
Mayhew's Black Handle.....50%
Mayhew's Monarch.....45%10%
P. S. & W.....70%
Sargent & Co.'s
No. 1, Forged Blade.....60%10%10%
Nos. 20, 40 and 60.....60%10%10%
Screw Driver Bits, Parr's, 1/2 gross, \$6.25
Screw Driver Bits.....1/2 doz., 50%75%
Stanley R. & L. Co.'s
No. 64, Varnished Handles.....65%10%
Stearns'.....25%10%25%
Syracuse Screw Driver Bits.....30%30%25%
C. T. Williamson Wire Novelty Co.....50%

Egg Beaters—See *Beaters, Egg*.
Egg Poachers—
See *Poachers, Egg*.
Electric Bell Sets—
See *Bells, Electric*.
Emery—No. 4 to No. 54 to Flour, CF
48 gr. 150 gr. F.F.F.
Kegs, 1/2 in.....4%
1/4 kegs, 1/2 in.....5%
10 1/2 cans, 10.....5%
in case.....6%
10 1/2 cans, less than 10.....10%
Enameled and Tinned Ware—See *Ware, Hollow*.
Escutcheon Pins—
See *Pins, Escutcheon*.
Escutcheons—
Brass Thread.....60%60%10%
Door Lock.....Same dis. as Door Locks.
Wood.....25%

Expanded Metal—
List No. 5.
Door Mats, Galvanized.....25%
Fencing, Painted Sheets.....20%
Lathing.....10%
Netting, Painted Sheets.....20%
Tree Guards, Paneled.....15%
Window Guards, Paneled.....15%

Extractors, Lemon Juice—
See *Squeezers, Lemon*.
Fasteners, Blind—
Austin & Eddy No. 2008.....1/2 gr., \$9.00
Mackrell's, 1/2 doz., \$1.00.....20%20%10%
Security Entry.....\$15 gr., \$9.00
Van Sand's Old Pat.....\$15 gr., 55%10%
Van Sand's Screw Pat, \$15 gr., 60%10%
Zimmerman's.....50%10%

Faucets—
B. & L. B. Co.
West's Lock, Open and Shut Key.....50%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl. lots.....60%10%
Cerk Lined.....70%5%70%10%
Fenn's.....30%
Fenn's Cork Stop.....40%
Frary's Pat. Petroleum.....60%
Metallic Key, Leather Lined.....60%10%
60%10%10%
John Sommers'
Peerless Best Block Tin Key.....40%
DKL, 1/2 quantity, Cork Lined.....50%
DKL, 1/2 quantity, Cork Lined.....50%
Perfection, Fla. Red Cedar (in boxes) 40%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
O. K. Western Pattern Cork Lined.....50%
No Brand, Red Cedar (in bbls.).....60%10%
Western Pattern Metal Key.....40%
No Brand Metal Key.....60%
Self Measuring
Enterprise, 1/2 doz., \$36.00.....20%
Lane's 1/2 doz., \$36.00.....25%10%
Star
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list.....60%

Felloe Plates—
See *Plates, Felloe*.
Fibre Ware—See *Ware, Fibre*.
Fifth Wheels—
Derby and Cincinnati.....45%25%
Brewster.....50%25%

Files—
Domestic—
American.....60%10%60%10%25%
Arcade.....60%10%5%60%10%10%
Eagle.....60%10%10%70%
G. & H. Barnett (Black Diamond)
60%10%5%60%10%10%
Nicholson Files, Rasps, &c., 60%10%25%
Nicholson (X.F.) Files.....60%10%10%
Nicholson's Royal Files (Second).....25%
(extra prices on certain sizes.)
Other makers, best brands, 60%10%60%70%
Fair brands.....70%10%70%10%10%
Second quality.....80%80%25%
Arcade Horse Rasps.....60%10%60%10%25%
Cheese Horse Rasps, Hand Cut.....50%10%
Heller's Horse Rasps.....50%10%60%
McCaffrey's Horse Rasps.....50%10%
Trojan Horse Rasps.....60%10%5%

Imported—
Butcher.....Butcher's list, 20%
Stubbs.....Stubbs' list 25%30%

Fixtures Grindstone
Moore's.....55%
P. S. & W. Co.....50%10%
Reading Hardware Co.....30%10%
Sargent's Patent.....70%10%

Fluting Machines—
See *Machines, Fluting*.
Fluting Scissors—
See *Scissors, Fluting*.
Fodder Squeezers—
See *Squeezers, Fodder*.
Forks—
Hay, Manure, &c. Asso. List, 70%70%5%25%
Hay, Manure, &c., Phila. List, 60%60%10%25%
Plated, see Spoons.

Frames—
Saw—
Red, Polished and Varnished.....1/2 doz., \$1.50, 25%
White Vermont.....1/2 gro., \$9.00, \$10.00

Screen, Window and Door—
Bonanza Window Screens, 50%50%50%10%
Cortland.....40%40%25%
Empire Fancy Screen Doors, 1/2 doz., \$12
Phillips' Window Screen Frames.....50%50%25%

Porter's Pat. Window and Door Frame.....33%4%10%
Stearns' Frames and Corners.....25%25%10%
Warner's Screen Corner Irons.....33%4%10%

Freezers, Ice Cream—
American.....60%
Arctic.....70%70%25%
Blizzard.....70%
Boss and Pet.....60%10%10%10%
Buffalo Champ.....65%55%25%
Confectioner's Machine.....60%
Crown.....60%
Double Action Crown.....60%
Gem.....65%
Giant.....60%
Good Luck.....65%55%25%
Granite State.....60%10%10%
Keystone, P. D. & Co., each, \$1.50.....20%
Model.....60%60%25%
Peerless.....60%10%
Shepard's Lightning.....65%55%25%
Standard.....60%60%25%
Standard Double Action.....60%60%25%
Star.....60%60%25%
White Mountain.....60%60%25%
Zero.....70%

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly*.
Fruit Pickers—
See *Pickers, Fruit*.
Fry Pans—See *Pans, Fry*.
Funnels—
Gersdorf's Perfection, Standard and
Globe; Tin, 1 gro., 10% 2 to 5 gro.,
20% 5 to 10 gro., 15% 6 to 12
doz., 20% 1 to 6 doz., 15% 6 to 12
doz., 20% 1 over 12 doz.....25%

Furnaces, Soldering—
Burgess No. 3 Gem, Copper reservoir, \$8.50
Burgess No. 3 Gem tin reservoir.....\$7.00
Clayton & Lambert No. 1 Fire-Pot,
complete.....\$6.00
Fuse—Dis. 100 ft. cash, 1/2 in, 1000 ft.
Common Cotton Fuse, for dry ground, 2.80
Common Hemp Fuse, for dry ground, 2.80
Double Taped Fuse, for very wet gr., 5.60
Single Taped Fuse, for wet ground, 4.75
Triple Taped Fuse, for very wet gr., 6.40
Large Gutta Percha Fuse, for water, 15.00
Small Gutta Percha Fuse, for water, 10.00

Gates Molasses—
Boss, 1/2 doz.:
No. 1, \$7; No. 2, \$8; No. 3, \$9; No. 4,
\$10.....60%10%10%
Lincoln's Pattern.....70%70%10%
Stebbin's Genuine.....60%10%10%
Stebbin's Pattern.....80%10%60%10%
Stebbin's Tinned Ends.....40%10%
Weed's.....20%10%

Gauges—
Barrett's Comb. Roller Gauge.....1/2 doz., \$8.00 to \$8.50
Hoague & Peck's Champion Gauge—
With Scale.....1/2 doz., \$5.00
Without Scale.....1/2 doz., \$4.00
Marking, Mortise, &c.....60%10%
Stanley R. & L. Co.'s Butt and Rabbit
Gauge.....40%10%
Starrett's Surface, Center and Scratch
Wire, Brown & Sharpe's.....10%20%
Wire, Morse's.....25%
Wire, P. S. & W. Co.....10%10%
Wire, Wheeler, Madden & Co.....10%

Gimlets—
Nail and Spike.....50%10%10%
Diamond Gimlets.....1/2 gr \$5.00
Eureka Gimlets.....60%10%
Double Cut, Douglass'.....40%10%
Doub & Cut, Ives'.....60%60%25%
Double Cut, Shepardson's.....40%45%25%

Glue—
Dis. Liquid Glue.....25%25%25%
Improved Process.....25%25%25%
Le Page's Liquid.....25%25%25%
Upton's Liquid.....35%
Glue Pots—See *Pots, Glue*.
Grease, Axle—
Axle, tin boxes.....1/2 gross \$12.00
Dixon's Everlasting.....10 1/2 pails, ea. 85%
Dixon's Everlasting, in bxs., 1/2 doz 1 m
\$1.25 2 m \$2.00
English Coach, 5 1/2 tin pails, 1/2 doz, \$3.60
English Coach, wooden boxes.....1/2 gross \$8.50
Fraser's.....Keg 1/2 4, Pall 1/2 5
Fraser's, in boxes.....1/2 gr \$9.50
Lower grades, special brands.
Tiger, 5 1/2 tin pails.....1/2 gr \$5.50 to \$7.00
Tiger, wooden boxes.....1/2 doz \$2.85

Grindstones—
Family, regular list.....60%
Family, Cleveland Stone Co.....20%
Grindstone Fixtures—
See *Fixtures, Grindstone*.
Gun Powder—See *Powder*.
Hack Saws—See *Saws*.
Hafe, B. A. W.
Sawing, Long.....1/2 doz., \$1.75
Pat. Sewing, Long.....1/2 doz., \$2.00
Pat. Sewing, Short, 1/2 doz., 45%50%
Pat. Peg Leather Top, 1/2 doz 45%50%
Pat. Peg, Plain Top 1/2 doz.....40%45%

Pullers Nail—

Ellipse.....doz., \$24.00, 40%
 Economy.....doz., \$18.00, 40%
 Giant, No. 1.....doz., \$18.00, 10%
 Giant, No. 2.....doz., \$15.00, 10%
 Pelican.....doz., \$18.00, 35%
 Seranton.....doz., \$18.00, 35%

Pulleys—

Brass Screw.....70%
 Hay Fork, "Anti-Friction," 5 in. solid.....50%
 Hay Fork, "F" Common and Patent Bushed.....20%
 Hay Fork, Moore's Anti-Friction 5 in. Wheel, doz., \$12.00, 40%
 Hay Fork, Reed's Self-Lubricating.....60%
 Hay Fork, Solid Eye, 50x100x10x5.....\$4.50
 Hay Fork, Tarbox Pat. Iron.....20%
 Hot House, Awning, &c.....60x70%
 Japanned Clothes Line.....60x10%
 Japanned Sewer.....80x10x10%
 Japanned Side, Anti-Friction.....40%
 Moore's Cellar, Anti-Friction.....50%
 Moore's Dumb Waiter, Anti-Friction.....50%
 Moore's Electric Light.....33%
 Moore's Side, Anti-Friction.....50%
 Sash (Auger Mortise).....60%
 Camper Sense.....60%
 Ace.....60%
 Ideal, Nos. 2, 4, 10 & 15 doz net, Star.....doz net
 Ideal, Nos. 25 and 55.....doz. 22% net.
 On bbl. lots extra 5%.

Shade Rack—

Shepard's Niagara, No. 55.....45%
 Tackle Blocks—See Blocks.

Pumps—

Cistern, Best Makers.....60x60x10%
 Pitcher Spout, Best Makers.....67x60x10%
 Pitcher Spout, Cheap, 9's.....75x75x10%
 Myers' Pumps, low list.....50%

Punches—

Avery's Revolving.....40%
 Avery's Sawset and Punch—See Sawsets
 Bemis & Call Co.'s Cast Steel Drive.....55%
 Bemis & Call Co.'s Check.....55%
 Bemis & Call Co.'s Spring.....50x55%
 Bemis & Call Co.'s Springfield Socket.....65%
 Niagara Hollow Punches.....20x22%
 Niagara Solid Punches.....55%
 Rice Hand Punches.....15%
 Saddler's or Drive, doz., 60x65%
 Spring, good quality.....doz. \$2.50 to \$2.60
 Spring, Leach's Pat.....15%
 Solid Tinnings, P., S. & W. Co., doz.....\$1.44
 Tinnings' Hollow Punches, P., S. & W. Co.....20x2%

Rail—

Barn Door, Light, In. 1/2 3/4 5/8
 Per 100 feet.....\$2.00 2.50 3.10, 10%
 B.D. for N. E. Hangers.....Small, Med. Large.
 Per 100 feet.....\$3.15 2.70 3.25 Net
 Carrier, double braced, Steel Rail, 1/2 foot.....3%
 Lundy Parlor Door, Planed Edge, 1/2 ft. 5/8
 Moody Steel Rail, 1/2 ft. 5/8.....45%
 Moore's Steel Rail.....25x10%
 Sliding Door, Bronzed Wt Iron, 1/2 ft. 5/8
 Sliding Door, Iron, Painted, 1/2 ft. 4/8, 40%
 Sliding Door, Wt Brass.....1/2, 3/8, 40%
 Terry's Steel Rail, 1/2 ft. 4/8
 Victor Track Rail, 7/8 foot.....60x2%

Rakes—

Cast Steel, Association 4's.....70x70x5x2%
 Cast Steel, outside 4's.....70x70x5x2%
 Malleable.....70x70x5x2%
 Fort Madison Prize Bow Brace and Feetless.....65%
 Fort Madison Steel Tooth Lawn Rake, \$6.00.....doz.
 The Gibbs'.....doz. \$4.90
 Gibbs' Acme Lawn Rake.....doz. \$4.75
 Gibbs' Canton Lawn Rake.....doz. \$3.75
 Gibbs' Crown Lawn Rake, No. 1.....doz. \$4.00
 Gibbs' Favorite Lawn Rake.....doz. \$4.90
 Gibbs' Hustler No. 0.....doz. \$4.25
 Gibbs' Hustler No. 1.....doz. \$4.40
 Oneida Lawn Rake.....doz. \$6.00

Razors—

Campbell Cutlery Co.....50%
 Electric Cutlery Co.....Net prices
 Galvanic.....doz. \$15.00
 Jordan's AAAI, new list.....Net prices
 Jordan's Old Faithful, new list.....Net prices
 J. R. Torrey Razor Co.....Net prices
 Wostenholme and Butcher, 10 to 2.....10%

Razor Strops—

See Strops, Razor.

Registers—

Moore's Bronze Finishes.....70%
 Moore's Electroplated.....75%
 Moore's Japanned.....75%
 Moore's Solid Bronze.....65%
 Moore's Stove Pipe.....33%

Rings and Ringers—

Bull Rings—
 Ellrich Edw. Co., White Metal, low list.....50x60x10%
 Hotchkiss' low list.....30%
 Humason, Beckley & Co.'s.....70x10%
 Peck, Stow & W. Co.'s.....50x10x50x10x10%
 Sargent's.....75x10%
 Union Nut Co.....65%

Hog Rings and Ringers—

Blair's Hog Ringers.....doz \$2.00
 Blair's Hog Ringers.....doz \$0.90 to \$1.00
 Brown's Ringers.....doz \$1.10 to \$1.25
 Brown's Ringers.....doz \$1.15 to \$1.25
 Champion Rings, Double.....doz \$2.25
 Electric Hog Ringers.....doz \$2.00
 Electric Hog Ringers.....doz boxes \$1.50
 Hill's Improved Ringers.....doz \$1.25
 Hill's Old Style Ringers.....doz \$1.00
 Hill's Ringers.....doz \$1.00
 Hill's Tongs.....doz \$3.00
 Major Ringers.....doz \$2.00
 Major Ringers.....doz \$1.25
 Perfect Ringers.....doz \$2.15 to \$2.25
 Perfect Ringers.....doz bxs \$1.50
 Top of one Hill Ringers.....doz \$2.00
 Top of the Hill Ringers.....doz \$1.25

Rivets and Burrs—

Norway Iron, list Nov. 17, '87.....60x10%
 Second quality.....70%
 Copper.....60x60x10%
 Coppered Iron, Betina, Brand.....60x5%

Rivet Sets—See Sets.**Roasting and Baking Pans—See Pans, Roasting and Baking.****Rods—**

Stair, Black Walnut.....doz 40%
 Stair, Brass.....25x30%

Rollers—

Acme Moore's Anti-Friction.....55%
 Barn Door, Sargent's list.....60x10x10%
 Moore's Barn Door Stay.....50%
 Union Barn Door Roller.....70%
 Thompson Mfg. Co.'s Lawn Rollers.....30%

Rope—The following prices are f.o.b. New York or factory, and are shaded 1/4 @ 3/4 on large lots; terms, 1 1/2 % for cash.
 Manila, 7-16 in. diam. and larger.....7 1/2 @ 8 1/2
 Manila, 1/4 and 5-16 in. diam.....8 1/2 @ 9 1/2
 Manila, Tarred Rope.....7 1/2 @ 8 1/2
 Manila, Hay Rope, Med'm.....7 1/2 @ 8 1/2
 Sisal, 7-16 in. and larger.....5 1/2 @ 6 1/2
 Sisal, 1/4 and 5-16 in. diam.....7 @ 7 1/2
 Sisal, 1/4 and 5-16 in. diam.....6 1/2 @ 7 1/2
 Sisal, Hay Rope.....5 1/2 @ 6 1/2
 Sisal, Tarred Rope.....5 @ 6 1/2
 Sisal, Medium Lath Varn.....5 1/2 @ 6 1/2
 New Zealand.....7-16 in. and larger.....5 1/2 @ 6 1/2
 New Zealand, 1/4 and 5-16 in. diam.....5 1/2 @ 6 1/2
 New Zealand, Hay Rope.....5 1/2 @ 6 1/2
 New Zealand, Tarred Rope.....5 @ 6 1/2
 Cotton Rope.....5 1/2 @ 6 1/2
 Jute Rope.....5 @ 6 1/2

Wire—

List February, 1892. All kinds.....45%

Rules—

Boxwood.....80x10x10x80x10x10%
 Ivory.....50x10%
 Starrett's Steel Rules and Straight Edges.....25x10%

Sad Irons—See Irons, Sad.**Sand and Emery Paper and Cloth—**

See Paper and Cloth.

Sash Cord—See Cord, Sash.**Sash Locks—See Locks, Sash.****Sash Weights—**

See Weights, Sash.

Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.**Saws—**

Note.—Extra 50x10% often given.

Atkins' Circular.....50x10%
 Atkins' Circular, list.....50x10%
 Atkins' Mulay, Mill and Drag.....50x10%
 Atkins' One-Man Saw.....40%
 Atkins' Wood Saws.....40%
 Diston's Circular.....45x45x5%
 Diston's Cross Cut, list Jan. 1, '93, 40x10%
 Diston's Hand.....25%
 O. J. Jones & Co.'s.....25%
 Peace Circular and Mill.....45x45x5%
 Peace Cross Cut, list Jan. 1, '93, 45x10%
 Peace Hand, Panel and Rip.....25x25x5%
 Richardson's Circular and Mill, 45x45x5%
 Richardson's X Cuts, list Jan. 1, '93, 45x10%
 Richardson's Hand, &c.....25x25x5%
 Simonds' Circular Saws.....45x45x5%
 Simonds' Crescent Ground Cross Cut Saws.....30%
 Simonds' Gang, Mill, Mulay and Drag Saws.....45x45x5%
 Wheeler, Madden & Clemson Mfg. Co. Cross Cuts, list Jan. 1, 1893.....45x10%
 Woodrough & McParlin.....30x10%
 Cross Cuts, list Jan. 1, 1893.....45x10%
 Hand, Panel and Rip.....25x10%

Hack Saws—

Eureka and Crescent.....25%
 Griffin's, complete.....40x10x60%
 Griffin's Hack Saw Blades.....40x10x60%
 Star Hack Saws and Blades.....25%

Scroll—

Barnes' Builders' and Cab Makers' \$15, 25%
 Barnes' Scroll Saw Blades.....35%
 Lester, complete, \$10.00.....25%
 Rogers, complete, \$4.00.....25%

Saw Frames—

See Frames, Saw.

Saw Sets—See Sets, Saw.**Saw Tools—See Tools, Saw.****Scales—**

Chatillon's Eureka.....25%
 Chatillon's Favorite.....40%
 Chatillon's Grocers' Trip Scales.....50%
 Family, Turnbills.....80x30x10%
 Hatch, Counter, No. 171, good quality.....doz \$18.00 to \$19.00
 Hatch, Tea, No. 161.....doz \$8.50 to \$9.00
 Riehle Bros' Platform.....40%
 Union Platform, Plain.....\$2.10 to \$2.20
 Union Platform, Striped.....\$2.40 to \$2.50

Scale Beams—

See Beams, Scale.

Scissors, Fluting.....45%**Scrapers—**

Adjustable Box Scraper (S. R. & L. Co.).....\$8.00.....40x10%
 Box, 1 Hand,.....doz \$2.00
 Box, 2 Hand,.....doz \$5.00 to \$6.00
 Defiance Box and Ship.....20x10%
 Foot.....50x10x60%
 Ship, Common.....doz \$5.50
 Ship, R. I. Tool Co.....10%

Screen Window and Door

Frames—See Frames

Screw Drivers—

See Drivers, Screw

Screws—**Bench and Hand—**

Bench, Iron.....55x10x55x10x10%
 Bench, Wood, Beech.....doz \$2.25
 Bench, Wood, Hickory.....20x10%
 Hand, Wood.....25x10x25x10x5%
 Hand, Grand Rapids, list.....35%
Coach, Lag and Hand-Rail—
 Lag, Blunt Point, list Jan. 1, 1890.....80x10x80x25%
 Coach and Lag, Gimlet list Jan. 1, 1890.....80x10x80x20%
 Hand Rail, Am. Screw Co.....75%
 Hand Rail, H. & B. Mfg. Co.....70x10x75%
 Hand Rail, Sargent's.....70x10%

Jack Screws—

Jack Screws, Millers Falls list, 50x50x10%
 Jack Screws, P., S. & W.....35%
 Jack Screws, Sargent.....70%
 Jack Screws, Stearns.....40x40x10%

Cork—

Detroit Cork Screw Co.....33x4%
 Humason & Beckley Mfg. Co., 40x10x50%
 Williamson's.....33x4x10x25%
 Williamson's Forged Worm, Applewood Handle, doz., \$5.00; Rosewood, \$5.50.....40%

Machine—

Flat Head Iron.....65%
 Round Head Iron.....60%

Wood—

List January 1, 1891.
 Flat Head Iron.....70%
 Round Head Iron.....65%
 Flat Head Brass.....70%
 Round Head Brass.....65%
 Round Head, Brown.....65%
 Rogers' Drive Screws.....82x4%

Scroll Saws—See Saws, Scroll.**Scythes—**

Grain.....40x5x40x10%
 Grass.....40x10x50%

Scythe Snaths—

See Snaths, Scythe.

Sets—

Awl and Tool—
 Alken's Sets, with and Tools, No. 20, \$10.00.....60x60x5%
 Common Brad Sets, No. 42, \$10.50; No. 43, \$12.50.....70x10x5%
 Fray's Adj. Tool Hdds., Nos. 1, \$12; 2, \$13; 3, \$12; 4, \$9.....doz \$5.50
 Fray's Combination.....doz \$5.50
 Millers Falls & Co. Tool Hdds., No. 1, \$12; No. 4, \$12; No. 5, \$13.....25%
 Stanley's Excelsior: No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50.....80x10%

Nail—

Round.....gr. \$3.25
 Square.....gr. \$4.00 to \$4.25
 Buck Bros.....27x6%
 Cannon's Diamond Point.....gr. \$12, 20%

Rivet—

Regular list.....70%

Saw—

Atkin's Criterion.....doz No. 1, \$6.00
 Atkin's Genuine.....\$13.00, 50x10x60%
 Atkin's Imitation.....doz \$3.00 to \$3.25
 Atkin's Lever.....doz No. 1, \$6.00
 Avery's Saw Set and Punch.....50%
 Bemis & Call Co.'s Cross Cut.....30x5%
 Bemis & Call Co.'s Plate.....20%
 Bemis & Call Spring Hammer.....30x5%
 Common Lever.....doz \$2.00, 45x50%
 Crescent.....doz \$3.00
 Cross Cut (Keller), No. 1, \$15.00; No. 2, \$24.00.....40x10x50%
 Diston's Star.....25%
 Hammer, Bemis & Call Co.'s new Pat. 45%
 Hammer, Hotchkiss.....\$5.50, 10%
 Hart's Pat. Lever.....20%
 Kohler's Giant Royal.....doz \$12.00
 Kohler's Royal.....doz \$7.00
 Leach's, No. 0, \$8.00; No. 1, \$15.....15x20%
 Leopold.....40x10x60%
 Lloyd's Acme.....doz \$15, 40x10%
 Morrill's No. 1, \$15.00.....40x20%
 Nos. 3 and 4, Cross Cut, \$23.00.....40x20%
 No. 5, Mill, \$51.00.....40x20%
 No. 10, \$15.00.....40x20%
 No. 11, \$16.00.....40x20%
 Nash's.....20x10x40%
 Stillman's Genuine.....doz \$5.00 to \$7.00, 40x5%
 Stillman's Pattern, Hand, \$3.25.....doz \$5.50 to \$6.00
 Taintor Positive.....doz \$18, 50%

Sharpeners, Knife—

Larkins'.....doz \$6.00, 40%
 Rosewood or Cocobola.....doz \$9.00, 40%

Shaves, Spoke—

Iron.....45%
 Wood.....30%
 Bailey's (Stanley R. & L. Co.).....50x10%
 Cincinnati.....25x10%
 Goodell's.....doz \$9.00.....25%
 Stearns'.....30x10%

Shears—

Acme Cast Shears.....10x10%
 American (Cast) Iron.....75x10x75x10x5%
 Barnard's Lamp Trimmers.....doz \$3.75
 Cast Steel Trimmers:
 First quality.....80x80x10%
 Second quality.....80x10x10%
 Cannon Cutlery Co., 75x10x10%
 Nickel Plated.....65%
 Claus brand, Japanned.....70%
 Claus brand, Nickeled, same list.....60%
 Clipper.....10x10%
 Davenport Cutlery Co.....60x60x10%
 Diamond Cast Shears.....10%
 Electric Cutlery Co.....75%
 Galvanic 3/4 to 9 in., doz. \$1.00, incl. Hatch Cutlery Co., Solid Steel Forged, 60%
 Heinisch's, List Dec. 1881.....60x10x10x60x10x5%
 Heinisch's Tailor's Shears.....33x4%
 Hoag Bros. & Hulbert, Solid Forged Steel.....20x10%
 Seymour's, List Dec. 1881.....40%
 Victor Cast Shears.....75x10x75x10x5%

Tinners' Snips—

Cast Handles, Laid with Steel.....40%
 Niagara Snips and Shears.....20x10%
 Wrt. Handles, Steel Blades.....20x10x10%

Pruning Shears and Hook

Diston's Combined "Pruning" Hook and Saw.....doz \$18.00, 20x10%
 Diston's Pruning Hook, doz. \$12.00
 Dunlap's Saw and Chisel, doz \$8.50, 30%
 Henry's Pruning Shears, doz. \$4.25.....\$4.50
 E. S. Lee & Co.'s Pruning Tools, 50x10x70%
 Levin Pruner No. 1, \$15.00; No. 2, \$21.00; No. 3, \$25.00; No. 4, \$30.00; No. 5, \$35.00; No. 6, \$40.00; No. 7, \$45.00; No. 8, \$50.00; No. 9, \$55.00; No. 10, \$60.00; No. 11, \$65.00; No. 12, \$70.00; No. 13, \$75.00; No. 14, \$80.00; No. 15, \$85.00; No. 16, \$90.00; No. 17, \$95.00; No. 18, \$100.00; No. 19, \$105.00; No. 20, \$110.00; No. 21, \$115.00; No. 22, \$120.00; No. 23, \$125.00; No. 24, \$130.00; No. 25, \$135.00; No. 26, \$140.00; No. 27, \$145.00; No. 28, \$150.00; No. 29, \$155.00; No. 30, \$160.00; No. 31, \$165.00; No. 32, \$170.00; No. 33, \$175.00; No. 34, \$180.00; No. 35, \$185.00; No. 36, \$190.00; No. 37, \$195.00; No. 38, \$200.00; No. 39, \$205.00; No. 40, \$210.00; No. 41, \$215.00; No. 42, \$220.00; No. 43, \$225.00; No. 44, \$230.00; No. 45, \$235.00; No. 46, \$240.00; No. 47, \$245.00; No. 48, \$250.00; No. 49, \$255.00; No. 50, \$260.00; No. 51, \$265.00; No. 52, \$270.00; No. 53, \$275.00; No. 54, \$280.00; No. 55, \$285.00; No. 56, \$290.00; No. 57, \$295.00; No. 58, \$300.00; No. 59, \$305.00; No. 60, \$310.00; No. 61, \$315.00; No. 62, \$320.00; No. 63, \$325.00; No. 64, \$330.00; No. 65, \$335.00; No. 66, \$340.00; No. 67, \$345.00; No. 68, \$350.00; No. 69, \$355.00; No. 70, \$360.00; No. 71, \$365.00; No. 72, \$370.00; No. 73, \$375.00; No. 74, \$380.00; No. 75, \$385.00; No. 76, \$390.00; No. 77, \$395.00; No. 78, \$400.00; No. 79, \$405.00; No. 80, \$410.00; No. 81, \$415.00; No. 82, \$420.00; No. 83, \$425.00; No. 84, \$430.00; No. 85, \$435.00; No. 86, \$440.00; No. 87, \$445.00; No. 88, \$450.00; No. 89, \$455.00; No. 90, \$460.00; No. 91, \$465.00; No. 92, \$470.00; No. 93, \$475.00; No. 94, \$480.00; No. 95, \$485.00; No. 96, \$490.00; No. 97, \$495.00; No. 98, \$500.00; No. 99, \$505.00; No. 100, \$510.00; No. 101, \$515.00; No. 102, \$520.00; No. 103, \$525.00; No. 104, \$530.00; No. 105, \$535.00; No. 106, \$540.00; No. 107, \$545.00; No. 108, \$550.00; No. 109, \$555.00; No. 110, \$560.00; No. 111, \$565.00; No. 112, \$570.00; No. 113, \$575.00; No. 114, \$580.00; No. 115, \$585.00; No. 116, \$590.00; No. 117, \$595.00; No. 118, \$600.00; No. 119, \$605.00; No. 120, \$610.00; No. 121, \$615.00; No. 122, \$620.00; No. 123, \$625.00; No. 124, \$630.00; No. 125, \$635.00; No. 126, \$640.00; No. 127, \$645.00; No. 128, \$650.00; No. 129, \$655.00; No. 130, \$660.00; No. 131, \$665.00; No. 132, \$670.00; No. 133, \$675.00; No. 134, \$680.00; No. 135, \$685.00; No. 136, \$690.00; No. 137, \$695.00; No. 138, \$700.00; No. 139, \$705.00; No. 140, \$710.00; No. 141, \$715.00; No. 142, \$720.00; No. 143, \$725.00; No. 144, \$730.00; No. 145, \$735.00; No. 146, \$740.00; No. 147, \$745.00; No. 148, \$750.00; No. 149, \$755.00; No. 150, \$760.00; No. 151, \$765.00; No. 152, \$770.00; No. 153, \$775.00; No. 154, \$780.00; No. 155, \$785.00; No. 156, \$790.00; No. 157, \$795.00; No. 158, \$800.00; No. 159, \$805.00; No. 160, \$810.00; No. 161, \$815.00; No. 162, \$820.00; No. 163, \$825.00; No. 164, \$830.00; No. 165, \$835.00; No. 166, \$840.00; No. 167, \$845.00; No. 168, \$850.00; No. 169, \$855.00; No. 170, \$860.00; No. 171, \$865.00; No. 172, \$870.00; No. 173, \$875.00; No. 174, \$880.00; No. 175, \$885.00; No. 176

Snaps, Harness, &c.

Anchor (T. & S. Mfg. Co.)	50c
Fitch's (Bristol)	50c
Hotchkiss	10c
Andrews	50c
Sargent's Patent Guarded	70c
German, New Pat.	40c
Covert	50c
Covert, New Patent	50c
Covert, New E. E.	60c
Covert's Saddlery Works' Triumph	80c
John Fritz Snaps	70c
Kelley & Woolworth's Steel Harness	50c

Snaths

Snaths	50c
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Soldering Irons

See Irons, Soldering.

Spittoons, Cuspidors, &c.

Standard Fiberglass	50c
Cuspidors, 5 1/2-inch, No. 5, 3; No. 5, 2	50c

Spoke Shaves

See Shaves, Spoke.

Spoke Trimmers

See Trimmers, Spoke.

Spoons and Forks

Tinned Iron

Basting, Cen. Stamp Co.'s	70c
Best Table and Tea, Cen. Stamp Co.'s	70c
Buffalo, S. S. & Co.	35c

Silver Plated

4 months or 5% cash 30 days

Meriden Brit. Co., Rogers	40c
Rogers & Hamilton	40c
C. Rogers & Bros.	40c
Rogers & Bros.	40c
Reed & Barton	40c
Wm. Rogers Mfg. Co.	40c
Simpson, Hall, Miller & Co.	40c
Holmes & Edwards Silver Co.	40c
L. Boardman & Son	50c

Miscellaneous

Holmes & Edwards Silver Co.	50c
No. 67 Mexican Silver	50c
No. 30 Silver Metal	50c
No. 24 German Silver	50c
No. 50 Nickel Silver	50c
No. 49 Nickel Silver	50c

Wm. Rogers Mfg. Co.

18% Rogers' German Silver	60c
22% Rogers' Nickel Silver	50c

Rogers & Hamilton

Steel Goods	40c
Cimeter, Flatware	40c
Cimeter, Steel	40c
Crown Hamilton, Flatware and Cutlery	30c
German Silver	50c
Nickel Silver	50c
Britannia	50c
Boardman's Nickel Silver	50c
Boardman's Britannia spoons, case lots	50c

Spring

Torrey's Rod, 30 in.	50c
Warner's No. 1	50c
Gem (Col.)	50c
Star (Col.)	50c
Victor (Col.)	50c
Champion (Col.)	50c
Cowell's No. 1	50c
Rubber, complete	50c
Hercules	50c
Phoenix	50c

Carriage, Wagon, &c.

Elliptic, Concord, Platform and Half	50c
Scroll	50c
60x10x60x10x10 or net prices	50c
Cliff's Bolster Springs	25c

Squares

Steel and Iron	30c
Nickel Plated	30c
Try Square and T Bevels	50c
Diston's Try Square and T Bevels	50c
Winterbottom's Try and Miter	30c
Starrett's Micrometer Caliper Squares	25c
Avery's Flush Bevel Squares	40c
Avery's Bevel Protractor	50c

Squeezers

Blair's	50c
Blair's "Clump"	50c

Lemon

Porcelain Lined, No. 1	50c
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Wood, No. 2

Wood, Common	50c
Wood, Improved	50c
Bamboo	50c
Jennings' Star	50c
The Boss	50c
Dean's No. 1	50c
Little Giant	50c
King	50c
Hotchkiss Straight Flash	50c
Silver & Co. Glass	50c

Standard Fiber Ware

See Ware, Standard Fiber.

Staples

Barbed Blind, 1/2 in. and larger	50c
Barbed Blind, 1/2 in.	50c
Fence Staples, Galvanized	50c
Fence Staples, Plain	50c
Grand Crossing Tack Co.'s	50c

Steel Butchers

Nichols	50c
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Staples and Dies

Blacksmith's	50c
Waterford Goods	50c
Butterfield's Goods	50c
Lightning Screw Plate	50c
Reece's New Screw Plates	50c
Reversible Ratchet	50c
Gardner	50c
Green River	50c

Steps Bench

Morrill's	50c
Hotchkiss	50c
Weston's No. 1	50c

Stones, Grind-See Grindstones.**Scythe Stones**

Cleveland Stone Co., Ist Nov. 1892	50c
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Oil Stones, &c.

Pike Mfg. Co.	50c
Hindustan No. 1	50c
Sand Stone	50c
Turkey Oil Stone, 4 to 8 in.	50c
Lily White Washita	50c
Rosy Red Washita	50c
Washita Stone, Extra	50c
Washita Stone, No. 1	50c
Washita Stone, No. 2	50c
Lily White Slips	50c
Washita Slips, Extra	50c
Washita Slips, No. 1	50c
Arkansas Stone, No. 1, 3 to 5 in.	50c
Arkansas Stone, No. 1 1/2 to 3 in.	50c
Lake Superior	50c
Lake Superior Slips	50c

Stove Polish

See Polish, Stove.

Stretchers Carpet

Cast Steel, Polished	50c
Cast Iron, Steel Points	50c
Socket	50c
Bullard's	50c

Strops, Razor

Genuine Emerson	50c
Imitation	50c
Torrey's	50c
Badger's Belt and Com.	50c
Lamont Combination	50c
Jordan's Pat. Padded, Ist Nov. 1, 89	50c
Electric Cutlery Co.	50c
Campbell Cutlery Co.	50c

Stuffer, Sausage

Miles' Challenge	50c
Pat. No. 1, 15.00; No. 0	50c
Pat. No. 0	50c
Draw Cut No. 4, each	50c
Enterprise Mfg. Co., Ist Jan 17, '93	50c
Silver's	50c

Sweepers, Carpet and Lawn

Bissell No. 5	50c
Bissell No. 8	50c
Bissell, Grand	50c
Standard	50c
Domestic	50c
Domestic, No. 2	50c
Grand Rapids	50c
Crown Jewel, No. 1	50c
Magie	50c
Improved Parlor Queen	50c
Nickel	50c
Japanned	50c
Excelsior	50c
Grand	50c
Parlor Queen	50c
Housewife's Delight	50c
Ladies' Friend	50c
Ladies' Friend No. 2	50c
Advance	50c
Our Leader	50c
Triumph	50c
Supreme	50c
Easy Jap'd	50c
Gilt Edge	50c
Acme	50c
Imperial	50c
Grand Republic	50c
Jap'd	50c
Banner	50c
Jap'd	50c
The Star	50c
Reliable	50c
Rapid Jap'd	50c
Our Own	50c
Model	50c
Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates:	50c
5 dozen in 6 months	50c
10 dozen in 6 months	50c
Except on L. P. when 10 dozen price is \$18.50, and 25 dozen \$18.00.	50c

Lawn

Thompson Mfg. Co.	50c
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Swings

Davies Lawn	50c
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Tacks, Brads &c.

List October 19, 1889. Old established straight weights. Short weight goods are sold at lower prices.

Carpet Tacks

American, Tinned	50c
American, Tinned and Cop'd	50c
Steel, Bright and Blued	50c
Steel, Tinned and Coppered	50c
Sweden Iron, Blued	50c
Sweden Iron, Tinned	50c
American Iron Tacks, Domestic	50c
Sweden Iron Tacks	50c
S. S., Blued	50c
S. S., Tinned	50c
Lanc. Blued	50c
Lanc. Tinned	50c
Gimp and Lace Tacks	50c
S. S., Blued	50c
S. S., Tinned	50c
Lanc. Blued	50c
Lanc. Tinned	50c
Basket and Trimmers' Tacks	50c
Lanc.	50c
S. S.	50c
Hungarian Nails	50c
Concord and Patent Brads	50c
Leathered Tacks	50c
Brush Tacks, S. S.	50c
Looking Glass Tacks, S. S.	50c
Picture-Frame Points, S. S.	50c
Finishing Nails	50c
Trunk and Clout Nails	50c
Tinned or Coppered	50c
Basket Nails	50c
Chair Nails	50c
Cigar Box Nails	50c
Tin Capped Nails	50c

Miscellaneous

Double Point	50c
Wire Carpet Nails	50c
Claw Handle Carpet	50c
Bow Blue	50c

Bill Nye Brad Box

Bill Nye Brad Box	50c
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Christian Gilt Nails

Christian Gilt Nails	50c
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Plymouth Rock Carpet Tacks

Plymouth Rock Carpet Tacks	50c
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Home Tacks, No. 50

Home Tacks, No. 50	50c
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Home Tacks, No. 100

Home Tacks, No. 100	50c
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Home Tacks, No. 200

Home Tacks, No. 200	50c
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Home Tacks, No. 400

Home Tacks, No. 400	50c
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Home Tacks, No. 600

Home Tacks, No. 600	50c
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Home Tacks, No. 800

Home Tacks, No. 800	50c
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Home Tacks, No. 1000

Home Tacks, No. 1000	50c
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Home Tacks, No. 1200

Home Tacks, No. 1200	50c
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Home Tacks, No. 1400

Home Tacks, No. 1400	50c
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Home Tacks, No. 1600

Home Tacks, No. 1600	50c
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Home Tacks, No. 1800

Home Tacks, No. 1800	50c
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Home Tacks, No. 2000

Home Tacks, No. 2000	50c
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Home Tacks, No. 2200

Home Tacks, No. 2200	50c
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Home Tacks, No. 2400

Home Tacks, No. 2400	50c
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Home Tacks, No. 2600

Home Tacks, No. 2600	50c
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Home Tacks, No. 2800

Home Tacks, No. 2800	50c
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Home Tacks, No. 3000

Home Tacks, No. 3000	50c
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Home Tacks, No. 3200

Home Tacks, No. 3200	50c
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Home Tacks, No. 3400

Home Tacks, No. 3400	50c
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Home Tacks, No. 3600

Home Tacks, No. 3600	50c
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Home Tacks, No. 3800

Home Tacks, No. 3800	50c
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Home Tacks, No. 4000

Home Tacks, No. 4000	50c
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Home Tacks, No. 4200

Home Tacks, No. 4200	50c
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Home Tacks, No. 4400

Home Tacks, No. 4400	50c
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Home Tacks, No. 4600

Home Tacks, No. 4600	50c
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Home Tacks, No. 4800

Home Tacks, No. 4800	50c
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Home Tacks, No. 5000

Home Tacks, No. 5000	50c
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Home Tacks, No. 5200

Home Tacks, No. 5200	50c
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Home Tacks, No. 5400

Home Tacks, No. 5400	50c
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Home Tacks, No. 5600

Home Tacks, No. 5600	50c
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Home Tacks, No. 5800

Home Tacks, No. 5800	50c
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Home Tacks, No. 6000

Home Tacks, No. 6000	50c
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Home Tacks, No. 6200

Home Tacks, No. 6200	50c
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Home Tacks, No. 6400

Home Tacks, No. 6400	50c
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Home Tacks, No. 6600

Home Tacks, No. 6600	50c
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Home Tacks, No. 6800

Home Tacks, No. 6800	50c
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Home Tacks, No. 7000

Home Tacks, No. 7000	50c
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Home Tacks, No. 7200

Home

Whips

American Whip Co.: Length.	4½	5	5½	6	6½	7	7½	8 ft.
X. L. Whalebone Driving.....	\$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Eureka, Two-thirds Whalebone.....	15.00	16.50	18.00	20.00	22.00	24.00	26.00	28.00
Bull Bone, Half-length Whalebone.....	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00
American Standard.....	8.00	8.50	9.00	10.00	11.00	12.00	13.00	14.00
True Grip, Raw Hide Center.....	8.00	8.00	8.50	9.00	9.50	10.00	10.50	11.00
New Name, Stocked Java, Black and Wine Colors.....	8.00	8.00	8.50	9.00	9.50	10.00	10.50	11.00
Americus, 93 Pen Whip.....	8.00	8.00	8.50	9.00	9.50	10.00	10.50	11.00
Gents' Light Driving No. 112.....	8.00	8.00	8.50	9.00	9.50	10.00	10.50	11.00
Gents' Light Driving No. 108.....	8.00	8.00	8.50	9.00	9.50	10.00	10.50	11.00
Hand-made Stocked Java No. 103.....	8.00	8.00	8.50	9.00	9.50	10.00	10.50	11.00
A large variety of cheaper grades.....	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Team Whips.....	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Toy Whips.....	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Hardware Assortment, 10/American, 75 Whips for \$50.00.								

Wire and Wire Goods—**Iron—**

Market,	Br. & Ann., Nos. 0 to 18.	Extra 5@10%
Br. & Ann., Nos. 0 to 18.	75¢@10¢	often given
Cop'd, Nos. 0 to 18.	75¢@10¢	and low net
Galv., Nos. 0 to 18.	70¢@10¢	prices often
Tin'd, Nos. 0 to 18.	70¢@10¢	made on
Tin'd, Nos. 0 to 18.	70¢@10¢	large lots.

Stone,		
Br. and Ann'd,		
Nos. 18 to 18.....	80%	} Extra 10%
Nos. 19 to 28.....	80.25%	
Nos. 27 to 38.....	82.25%	
Tinned Broom Wire, 18 to 21, Br. d.....		often given.
Galvanized Fence.....		75.10%
Brass, 1st Jan. 18, 1884.....		40.25%
Copper, 1st Jan. 18, 1884.....		40.25%
Annealed Wire on Spools.....		60%
Mall'n's An'aled & Tin'd on Spools.....		60.25%
Mall'n's Brass and Cop. on Spools.....		60.25%
Ossawan Mills, An'd and Tinned on Spools.....		60.10%

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